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Vol. 948 Number 2

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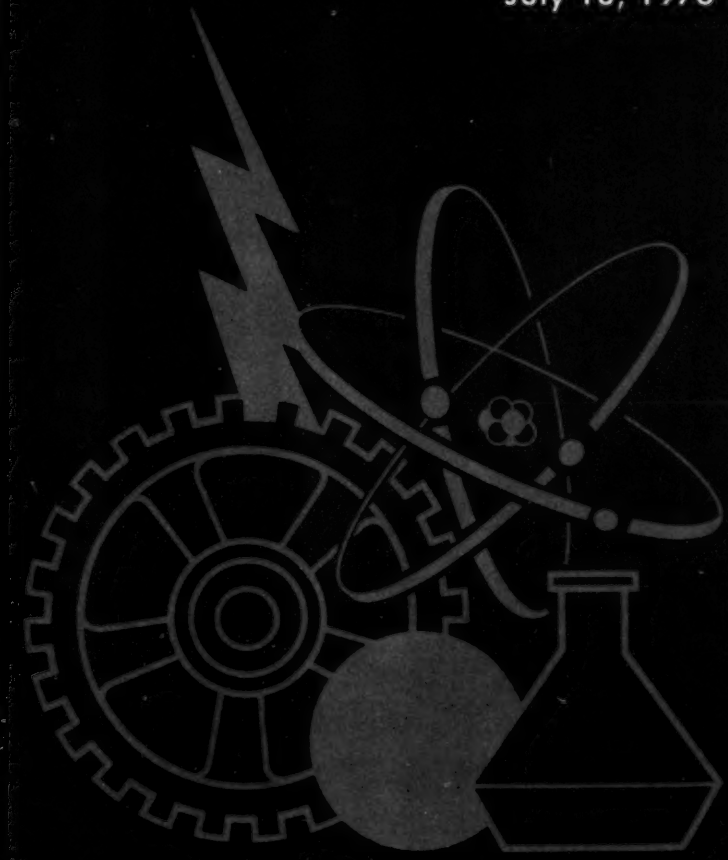
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

July 13, 1976



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 13, 1976 Volume 948 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventor's Day

The 5th Annual Inventor's Day Exposition will be held on Saturday and Sunday, February 5 and 6, 1977 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods. Such limited space dictates early consideration by prospective participants. No application can be considered after December 1, 1976.

Other than electricity and allotted space—floor, wall or table top—all expenses associated with each exhibit are to be borne by the exhibitor. Arrangements for delivery, return, setup, and teardown as well as individual exhibit personnel are the exhibitor's responsibility. Neither the Patent and Trademark Office, nor individual employees, can accept a collect shipment or provide storage.

The Patent and Trademark Office has established a committee which will select the items to be exhibited and allot available space. Suitability for dynamic demonstration and current public interests are prime considerations in selecting exhibits.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
Chairman.

June 14, 1976.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,574,043, Luber and Clutton, REFLECTIVE MATERIAL AND METHOD OF MAKING SAME; **3,585,381,** Hudson, Cartmell, Churchill and Jones, ENCAPSULATED CHOLESTERIC LIQUID CRYSTAL DISPLAY DEVICE; **3,637,291,** Kessler and Trzaska, DISPLAY DEVICE WITH INHERENT MEMORY; **3,647,280,** Klein and Caplan, LIQUID CRYSTAL DISPLAY DEVICE; **3,720,623,** Cartmell and Churchill, ENCAPSULATED LIQUID CRYSTALS; **3,802,945,** B. G. James, HEAT SENSITIVE NOVELTY DEVICE, **filed** Oct. 6, 1975, D.C., S.D.N.Y., Doc. 75–C–4896, *Seymour Rosen, doing business as Seymour Rosen Co.* v. *Hattie Carnegie Jewelry Enterprises, Ltd.* Action dismissed with prejudice, Nov. 17, 1975.

3,585,381. (See 3,574,043.)

3,598,727, C. B. Willock, ARTIFICIAL KIDNEY, **filed** Mar. 3, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–0474, *David Kopf Systems, Inc.* v. *DWS, Inc.*

3,605,225, Gibson and Protzmann, METHOD OF TREATING YARNS TO PROVIDE KINKING AND/OR MOTTLED EFFECTS IN FABRIC, **filed** Feb. 10, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–76–469–LTL, *H.G.P. Corporation* v. *R.H.S. Carpet Mills, Inc and Colormaster of California.*

3,637,291. (See 3,574,043.)

3,647,096, J. H. Holland, MATERIAL DELIVERY SYSTEM; **3,724,692,** same; **3,731,825,** Holland and Fox, SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM; **3,788,504,** J. H. Holland, MATERIAL DELIVERY SYSTEM; **3,791,511,** same, CONVEYOR SYSTEM; **3,794,194.** same, SELF-UNLOADING MATERIAL DELIVERY SYSTEM; **3,857,502,** Holland and Fox, SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM; **D.220,174,** J. H. Holland, SEMI-TRAILER, **filed** June 20, 1973, D.C. Minn. (Minneapolis), Doc. 4–73–C–324, *Orcon Industries, Inc.* v. *J. H. Holland Company et al.* Consent decree, plaintiff is hereby permanently enjoined from infringing any of said patents. All claims and counterclaims are hereby dismissed with prejudice, Dec. 18, 1975.

3,647,280. (See 3,574,043.)

3,658,327, G. S. Thiede, PULL TYPE EXERCISING DEVICE; **Reg. No. 971,804** (DYNA-GYM), Marcy Gymnasium Equipment Co., **filed** Apr. 25, 1975, D.C., S.D. Calif. (San Diego), Doc. 75–0227–T, *Marcy Gymnasium Equipment Co. and Clifford S. Thiede* v. *Total Gym, Inc.* Final judgment by consent of both parties. Case settled and dismissed, Feb. 12, 1976.

3,720,623. (See 3,574,043.)

3,724,692. (See 3,647,096.)

3,731,825. (See 3,647,096.)

3,743,793, S. T. Emerson, ANALOG SIGNAL RECORDING AND PLAYBACK METHOD AND SYSTEM; **3,754,264,** W. T. Blackband, RADIO DIRECTION FINDING APPARATUS, **filed** Jan. 20, 1976, D.C.N.J. (Camden), Doc. C–1813–73, *Periphonics Corporation* v. *All Systems, Inc. and Applied Information Industries, Inc.* Default judgment, defendant hereby restrained and enjoined from infringing said patents. Defendant's counterclaims under the anti-trust laws and for a declaratory judgment of patent invalidity and non-infringement are hereby dismissed. Judgment is entered in favor of plaintiff, Jan. 19, 1976.

3,754,264. (See 3,743,793.)

3,776,473, Casey and Badia, HIGHLY REFLECTIVE ALUMINUM FLAKE; **3,901,688,** same, **filed** Jan. 15, 1976, D.C. Pa. (Philadelphia), Doc. 76–135, *Silberline Manufacturing Co., Inc.* v. *International Nickel Co., Inc. and Alcan Aluminum Corp.*

3,788,504. (See 3,647,096.)

3,791,511. (See 3,647,096.)

3,794,194. (See 3,647,096.)

3,802,945. (See 3,574,043.)

3,802,945, B. G. James, HEAT SENSITIVE NOVELTY DEVICE, **filed** Oct. 10, 1975, D.C., S.D.N.Y., Doc. 75–C–5019, *Raymond Myers* v. *Hattie Carnegie Jewelry Enterprises, Inc.*

3,824,365, W. R. Tapper, MIROWAVE OVEN CONTROL SYSTEM, **filed** May 19, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1598, *Litton Systems, Inc.* v. *The Tappan Company.* Ordered that this cause is dismissed with prejudice as to all activities complained of in the complaint and counterclaim herein which have occurred prior to the date of this order, but otherwise without prejudice, Mar. 11, 1976.

3,846,944, H. Lambert, STRUCTURAL SELF-SUPPORTING SYSTEM; **Reg. No. 995,289** (RIVETIER), Barton-King Systems Corporation, doing business as Bassett Mfg. Corp., **filed** Jan. 22, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–158–SAW, *Barton-King Systems Corp.* v. *San Jose Systems.*

3,852,846, L. E. Slaybaugh, DOOR HOLD OPEN ATTACHMENT FOR A DOOR CHECK, **filed** Mar. 4, 1976, D.C.N.C. (Charlotte), Doc. C–C–76–77, *Republic Industries, Inc.* v. *Eaton Corporation.*

3,853,222, J. D. Helms, PRESSURIZATION APPARATUS, **filed** Mar. 4, 1976, D.C., N.D. Tex. (Dallas), Doc. CA–3–76–0346G, *Matchpoint Industries, Inc.* v. *O. T. Tatum.*

3,857,502. (See 3,647,096.)

3,887,268, Golden and Kennedy, FLASHING REFLECTOR SYSTEM, **filed** Oct. 28, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3622, *Beatrice Foods Co.* v. *Sate-Lite Mfg. Co.*

3,887,768, Forney, Jr. and Gallager, SIGNAL STRUCTURES FOR DOUBLE SIDE BAND-QUADRATURE CARRIER MODULATION, **filed** Jan. 26, 1976, D.C., C.D. Calif. (Los Angeles), Doc. 76–293–WMB, *Milgo Electronic Corporation and International Communications Corp.* v. *Codex, Inc.*

3,901,688. (See 3,776,437.)

3,916,265, J. J. Friedman, ADJUSTABLE SIGNAL HANGER AND DOUBLE DOOR TERMINAL DISCONNECT HOUSING, **filed** Mar. 15, 1976, D.C., S.D. Fla. (Miami), Doc. 76–515–C–NCR, *Cost Cast, Inc.* v. *Engineered Castings, Inc. and Jack J. Friedman.*

D.220,174. (See 3,647,096.)

D.220,644, L. D. Robinson, MONEY BOX, **filed** Aug. 7, 1975, D.C., E.D. Calif. (Sacramento), Doc. F–75–144–C, *L. Elsworth Robinson and Leva Delores Rabinson, individually and doing business as Cash Caddy Corporation* v. *Interstate Restaurant Supply Company, Inc.* Order of court dismissing the cause conditionally, Feb. 3, 1976.

Reg. No. 971,804. (See 3,658,327.)

Reg. No. 995,289. (See 3,846,944.)

3,789,833, N. Bom, HEART EXAMINATION BY MEANS OF ULTRASOUND WAVES, **filed** July 3, 1975, D.C. Conn. (Bridgeport), Doc. B–75–213, *Organon Teknika B.V.* v. *Hoffrell Instruments, Inc. and Russel Uphoff.* **Same, filed** Sept. 10, 1975, D.C. Ariz. (Phoenix), Doc. C–75–619–PHX, *Organon Teknika B.V.* v. *Advanced Diagnostic Research Corp. and Martin H. Wilcox.*

3,808,090, Logan and Luhde, MECHANICAL ABRASION OF WOOD PARTICLES IN THE PRESENCE OF WATER AND IN AN INERT GASEOUS ATMOSPHERE, **filed** Apr. 4, 1975, D.C., S.D.N.Y., Doc. 75–C–1650, *American Defibrator, Inc.* v. *Anglo Paper Prod. Ltd.*

3,814,725, Zimmerman and Isaacson, POLYALKYLENE TEREPHTHALATE MOLDING RESIN, **filed** June 6, 1975, D.C., S.D. Ind. (Evansville), Doc. CV–75–75–C, *Celanese Corporation* v. *General Electric Company.*

3,814,725, Zimmerman and Isaacson, POLYALKYLENE TEREPHTHALATE MOLDING RESIN; **3,873,491,** J. S. Gall, POLYALKYLENE TEREPHTHALATE MOLDING RESIN AND PROCESS FOR MAKING SAME, **filed** Oct. 21, 1975, D.C., S.D.N.Y., Doc. 75–C–5197, *Hooker Chemicals & Plastics Corp.* v. *Celanese Corporation.*

3,823,468, N. Hascoe, METHOD OF FABRICATING AN HERMETICALLY SEALED CONTAINER, **filed** June 4, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0698–C, *Semi-Alloys Incorporated* v. *Metalized Ceramics Corporation.* **Same, filed** July 21, 1975, D.C., W.D.N.Y. (Buffalo), Doc. 75–300, *Williams Gold Refining Company Incorporated* v. *Semi-Alloys Incorporated.*

3,823,468, N. Hascoe, METHOD OF FABRICATING AN HERMETICALLY SEALED CONTAINER; **3,874,549,** same, HERMETIC SEALING COVER FOR A CONTAINER FOR A SEMICONDUCTOR DEVICE, **filed** May 5, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0549–C, *Semi-Alloys Incorporated* v. *Plessey Incorporated and Plessey Industries, Inc.*

3,837,292, D. Wiebe, HYDRAULIC TRUCK SNUBBER, **filed** Mar. 17, 1976, D.C. Pa. (Philadelphia), Doc. C.A. 76–800, *Railroad Dynamics, Inc.* v. *A. Stucki Company.*

3,858,874, B. Wieder, PUSH-PULL TYPE OF EXERCISING DEVICE, **filed** Dec. 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–4294–F, *Wieder Health & Fitness* v. *Beacon Enterprises.*

3,863,402, D. Zenser, BICYCLE, **filed** Apr. 17, 1975, D.C., S.D. Tex. (Houston), Doc. 75–H–600, *Yamaha International Corporation* v. *Cycle Trend Corporation et al.*

3,858,874, B. Wieder, A PUSH-PULL TYPE OF EXERCISING DEVICE, **filed** Dec. 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–4294–F, *Wieder Health & Fitness* v. *Beacon Enterprises.*

3,867,517, C. Ling, DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES, **filed** Feb. 18, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–555 AAH, *Abbott Laboratories* v. *Curtis Laboratories.*

3,869,358, Nobel and Ostrow, ELECTROLYTES FOR THE ELECTROLYTIC DEPOSITION OF ZINC, **filed** Nov. 21, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c4000, *Lea-Ronal, Inc.* v. *Richardson Co.*

3,869,731, Waugh, Smith, Anzel and Orofino, ARTICULATED TWO-PART PROSTHESIS REPLACING THE KNEE JOINT, **filed** Aug. 22, 1975, D.C., Md. (Baltimore), Doc. H–75–1174, *The Regents of the University of California and Wright Manufacturing Company* v. *Howmedica, Inc.* **Same, filed** Mar. 9, 1976, D.C., N.J. (Newark), Doc. 76–449, *The Regents of the University of California et al.* v. *Howmedica, Inc.*

3,873,491. (See 3,814,725.)

3,874,549. (See 3,823,468.)

PATENT NOTICES

Certificates of Correction for the Week of July 13, 1976

Re. 28,600	3,914,684	3,940,048	3,950,198
Re. 28,797	3,915,934	3,940,737	3,950,357
D. 239,473	3,916,934	3,940,743	3,950,379
3,709,493	3,917,012	3,941,069	3,950,428
3,746,541	3,917,967	3,941,195	3,950,438
3,755,159	3,918,365	3,941,275	3,950,522
3,775,654	3,918,517	3,941,640	3,950,570
3,776,618	3,920,021	3,941,649	3,950,679
3,794,673	3,920,641	3,942,212	3,951,006
3,799,758	3,920,768	3,942,421	3,951,255
3,801,596	3,922,062	3,942,731	3,951,318
3,810,233	3,922,114	3,942,782	3,951,385
3,810,868	3,922,275	3,942,867	3,951,642
3,813,417	3,922,539	3,942,996	3,951,643
3,816,385	3,922,566	3,943,575	3,951,658
3,818,980	3,923,639	3,944,157	3,951,763
3,822,254	3,924,063	3,944,288	3,951,843
3,823,180	3,924,678	3,944,449	3,951,991
3,832,611	3,925,098	3,944,496	3,952,446
3,835,425	3,925,562	3,944,562	3,952,486
3,840,617	3,925,751	3,944,573	3,952,676
3,844,655	3,926,732	3,944,599	3,952,817
3,851,143	3,926,751	3,945,357	3,953,017
3,854,084	3,927,396	3,946,150	3,953,018
3,867,257	3,927,992	3,946,300	3,953,039
3,869,932	3,930,144	3,946,347	3,953,407
3,873,954	3,931,750	3,946,910	3,953,539
3,874,241	3,931,844	3,946,931	3,953,565
3,874,431	3,932,705	3,947,164	3,953,635
3,878,021	3,933,140	3,947,256	3,953,663
3,883,112	3,933,752	3,947,311	3,953,792
3,885,028	3,933,956	3,947,345	3,953,839
3,886,988	3,934,169	3,947,428	3,954,004
3,893,226	3,934,173	3,947,457	3,954,066
3,893,840	3,934,523	3,947,626	3,954,176
3,894,827	3,934,695	3,947,631	3,954,210
3,896,814	3,934,759	3,947,848	3,954,253
3,897,467	3,935,756	3,947,850	3,954,337
3,898,039	3,936,034	3,947,991	3,954,397
3,899,078	3,936,523	3,948,245	3,954,458
3,901,904	3,936,538	3,948,258	3,954,508
3,901,976	3,936,605	3,948,442	3,954,596
3,902,241	3,936,857	3,948,602	3,954,744
3,903,088	3,936,943	3,948,671	3,954,810
3,904,640	3,936,947	3,948,755	3,954,821
3,904,677	3,937,422	3,948,889	3,954,934
3,906,306	3,937,542	3,948,910	3,955,105
3,906,790	3,937,720	3,949,006	3,955,252
3,907,580	3,937,814	3,949,078	3,955,451
3,907,703	3,938,343	3,949,269	3,955,952
3,907,954	3,938,402	3,949,460	3,956,062
3,908,390	3,938,833	3,949,464	3,956,255
3,909,627	3,939,019	3,949,543	3,956,395
3,909,998	3,939,097	3,949,759	3,956,779
3,910,115	3,939,334	3,949,877	3,957,016
3,912,387	3,939,585	3,950,010	
3,912,862	3,940,023	3,950,145	

Patents Available for Licensing or Sale

3,095,861. METHOD AND APPARATUS FOR EXTRACTING HEAT FROM THE HOT EXHAUST GASES OF INTERNAL COMBUSTION ENGINES. Mr. A. Norris, 43 Highfield Drive, Hurstpierpoint, Sussex, BN6 9AU, England.

3,316,954. WRIGHT TIRE. Winston F. Wright, 2660 Fair Circle, Reno, Nev., 89503.

3,677,409. SEWAGE TREATMENT SYSTEM. Carl W. Ferm and Fred R. Sechler. Correspondence to: Mason, Fenwick & Lawrence, Suite 310, 1730 Rhode Island Ave., NW., Washington, D.C., 20005.

3,680,237. OUTDOOR ILLUMINATED SIGNS. John G. Finnerty, Sr., 100 Polifly Road, Hackensack, N.J., 07601.

3,807,707. EXTERIOR ADJUSTMENT METERING JET INSERT PLATE FOR CARBURETORS AND CARBURETOR MODIFYING METHOD. Harley D. Johnson. Correspondence to: Sherman Levy, Suite, 636, Washington Building, 11th New York Ave., NW., Washington, D.C., 20005.

3,837,197. KEY OPERATED LOCK. Pedro Lopez, 2295 De Londres, St. Laurent, Quebec, Canada, H4L 3A5.

3,848,915. TREE BALLING SPADE. Bernard Wherry, % Wherry Nurseries, P.O. Box 148, St. Marys, W. Va., 26170.

3,856,192. STEREO TAPE CARTRIDGE RACK. Charles R. Nelson, RD #1, Box 128, Duanesburg, N.Y., 12056.

3,861,484. HYDRID VEHICULAR POWER SYSTEM. Kenneth Joslin, 11223 West Lilac Road, Escondido, Calif., 92025.

3,874,174. GEOTHERMAL HEAT EXCHANGE METHOD AND APPARATUS. Clarence Kirk Greene, 100 N. Arlington Ave., Reno, Nev., 89501.

3,878,700. LOCK OPERATED BY AN AXIALLY BITTED KEY. Pedro Lopez, 2295 De Londree, Quebec, Canada, H4L 3A5.

3,911,752. REMOTE CONTROL CHANNEL CHANGER FOR TELEVISION RECEIVERS. Stephen A. Lazorcak, P.O. Box 33082, District Heights, Md., 20028.

3,915,323. VERSATILE BOAT LOADING APPARATUS USED ON RECREATIONAL VEHICLES. Oscar E. Underhill, 1009 Barrow St., Anchorage, Alaska, 99501.

3,928,879. INFLATABLE TUBE BODIES. Metzeler Kautschut AG, Munich, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,930,116. ELECTRIC OUTLET SAFETY PLATES OR COVERS. Theodore Richards, 1936 Sloat Blvd., San Francisco, Calif., 94116.

3,935,874. UMBRELLA ASSEMBLY. Helen Cohen, 251 Valentine St., Fall River, Mass., 02720.

3,937,224. COLOSTOMY CATHETER. Ronald L. Uecker, 915 Grant St., Wausau, Wis., 54401. Correspondence to: Jacques M. Dulin, Esquire, Suite 600, 135 South La Salle St., Chicago, Ill., 60603.

3,944,499. NON-AQUEOUS CLEANING COMPOSITION. Sabina Staniek, N.J. Correspondence to: Laurence, Stokes, & Neilan, Crystal Plaza One, Suite 805, 2001 Jefferson Davis Highway, Arlington, Va., 22202.

3,945,058. COLLAPSIBLE SAUNA BATH KIT. Kent A. Gardner, 210 S. Glenn Drive, Yakima, Wash., 98902.

3,947,641. USE OF PUBLIC SUBSCRIBER TELEPHONE NETWORK: METHOD AND APPARATUS. Anders E. Trell, Polhemsgatan 20, B4 112 36 Stockholm, Sweden.

3,957,053. DETACHABLY CONNECTED ACCUPUNCTURE NEEDLES. Yen-Kong Woo, 1545 Geary Bl. #1, San Francisco, Calif., 94115.

3,958,387. TRANSVERSE ROOFING STRIP. Sadao Kandabashi, Tokyo, Japan. Correspondence to: Y. Toyoda International Patent Office, No. 204, Sanshin Bldg. 4–1 Yurakucho, 1–Chome Chiyoda-ku, Tokyo, Japan.

3,960,344. PRECISION MOBILE GRAVITY SURVEY AND GUIDENCE SYSTEM. Virgil H. Dugan, 1614 East 47th St., Chattanooga, Tenn., 37407.

The following 8 patents are offered by: Larry Harold Kline, Attorney at Law, P. A., Suite 805, 18 Broad St., Charleston, S.C., 29401, A/C 803 577–7715.

3,913,637. HAROLD SEALS, REVOLVING BAGGING MACHINE.

3,913,635. HAROLD SEALS, BAG HOLDING AND FILLING DEVICE.

3,913,638. HAROLD SEALS, TAKE-OFF DEVICE.

3,933,185. HAROLD SEALS, SPILL COLLECTION DEVICE.

3,937,369. HAROLD SEALS, HOUSING FOR AN IMPELLER.

239,831. STEPHEN J. BAUMRIND, COMBINED SPLASH-GUARD AND HOLDER FOR BATHROOM ACCESSORIES.

3,955,789. STEPHEN J. BAUMRIND, TUBE HOLDER.

3,737,921. STEPHEN J. BAUMRIND, PERMANENT OR MOBILE SPLASH-GUARD.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 6 patents upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich., 48202.

3,719,365. SEAL STRUCTURE.

3,726,604. COOLED JET FLAP VANE.

3,727,515. PARALLEL CHAIN DRIVE DEVICE.

3,728,584. SEMICONDUCTOR DEVICE MOUNTING ADAPTER.

3,736,069. TURBINE STATOR COOLING CONTROL.

3,718,364. VEHICLE BODY AND FRAME CONSTRUCTION.

General Electric Company is prepared to grant non-exclusive licenses under the following 1 patent on reasonable terms, to domestic manufacturers.

Applications for licenses under the following patent may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Co., 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,955,131. CIRCUIT FOR CONTROLLING THE REVERSE CURRENT IN A CONTROLLED RECITIFIER.

Application for licenses under the following 1 patent may be addressed to: General Electric Company, Transportation System Business Division, 2901 East Lake Road, Erie, Pa., 16531.

3,899,725. BRAKING EFFORT CONTROL.

Application for licenses under the following 3 patents may be addressed to: Patent Counsel, Gas Turbine Products Division, General Electric Company, 1 River Road, Bldg. No. 500–2nd Floor, Schenectady, N.Y., 12345.

3,852,099. DENSE SILICON CARBIDE CERAMIC AND METHOD OF MAKING SAME.

3,853,566. HOT PRESSED SILICON CARBIDE.

3,928,901. FORMING A CLADDING SHEET TO A CONVEX/CONCAVE SUBSTRATE.

Application for license should be addressed to Division Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,580,860. INFRARED-EXCITABLE ALKALINE EARTH THORIUM FLUORIDE LUMINESCENT MATERIALS.

3,630,945. DIVALENT EUROPIUM ACTIVATED ALKALINE EARTH ALUMINUM FLUORIDE LUMINESCENT MATERIALS AND PROCESS.

3,635,833. MANGANESE ACTIVATED MAGNESIUM-LITHIUM ALUMINO-GALLATE LUMINESCENT MATERIAL.

3,666,674. URANYL-ACTIVATED STRONTIUM ZINC PYROPHOSPHATE PHOSPHORS.

3,676,361. TERNARY ALKALINE-EARTH PYROSILICATE LUMINESCENT MATERIALS ACTIVATED WITH DIVALENT EUROPIUM.

3,692,689. PHOSPHOR COMPRISING LANTHANUM CERIUM THORIUM PHOSPHATE.

3,702,828. EUROPIUM-ACTIVATED BARIUM AND STRONTIUM, CALCIUM ALUMINUM FLUORIDE PHOSPHORS.

3,790,490. EUROPIUM AND MANGANESE ACTIVATED STRONTIUM CHLOROSILICATE PHOSPHOR.

Application for licenses under the following 2 patents may be addressed to: General Electric Company, Division Patent Counsel, Switchgear & Distribution Transformer Division, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,951,712. METHOD FOR APPLYING HIGH-VOLTAGE ELECTRICAL INSULATION BY FILTERING OUT SUSPENDED PARTICLES FROM A SLURRY.

3,953,043. HIGH VOLTAGE CABLE SPLICE USING FOAM INSULATION WITH THICK INTEGRAL SKIN IN HIGHLY STRESSED REGIONS.

Applications for licenses under the following patents may be addressed: General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

3,024,731. ARRANGEMENT FOR ADJUSTING THE DISPLACEMENT OF A PISTON.

3,513,354. LIGHTNING ARRESTER WITH HIGH SURGE ENERGY ABSORBING CAPABILITY.

3,517,300. POWER CONVERTER CIRCUITS HAVING A HIGH FREQUENCY LINK.

3,619,721. TRIGGERED VACUUM GAP KEEP-ALIVE CIRCUIT.

Applications for licenses under the following patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,630,000. ELECTROSTATIC AIR CLEANER.

3,742,173. METHOD AND EQUIPMENT FOR COOKING ELECTRONICALLY BY SPECIFYING WATTS SETTING.

3,761,667. OUTPUT POWER CONTROL OF INDUCTION COOKING INVERTER.

3,764,793. LIGHTED CONTROL CONSOLE WITH INFORMATION CENTER.

3,767,883. CONTROL AND POWER SUPPLY SYSTEMS FOR MAGNETRON DEVICE.

3,785,433. AIR CONDITIONING SYSTEM INCLUDING INDOOR FAN SPEED CONTROL.

3,919,638. MICROWAVE DETECTION INSTRUMENT.

3,924,601. WALL OVEN EXHAUST DUCT SYSTEM.

3,927,658. SELF-LOCKING TRIM FRAME FOR BUILT-IN COOKTOP.

3,930,193. SCR INVERTER SYSTEMS.

3,931,496. ELECTRICAL HEATING PLATE WITH TERMINAL MEANS FOR HIGH TEMPERATURE FILM HEATER.

3,931,620. TEMPERATURE-RESPONSIVE ALARM CONTROL CIRCUIT.

3,932,849. SELF-CONTAINED, CONDITION RESPONSIVE CIRCUIT.

3,939,817. OVEN DOOR HANDLE CONSTRUCTION.

3,940,861. CONDENSER APPARATUS.

Application for licenses under the following patents may be addressed to: General Electric Company, Transportation System Business Division, 2901 E. Lake Road, Erie, Pa. 16501, attn.: Patent Counsel.

3,859,579. PROTECTION CIRCUIT FOR POWER CONVERTER SYSTEMS.

3,890,551. REGENERATIVE BRAKING CIRCUIT.

3,911,340. METHOD AND APPARATUS FOR AUTOMATIC IR COMPENSATION.

3,916,275. ACCURATE MOTOR SLIP CONTROL SYSTEM WITH SPEED RATE LIMITED.

3,919,620. INVERTER ADAPTIVE LOCK-OUT TECHNIQUE.

Applications for licenses under the following patents may be addressed to: Patent Counsel, Turbine Operations, Turbine Patent Operation, General Electric Company, 1 River Road, Building 43—Room 115, Schenectady, N.Y., 12345.

Re. 28,478. WINDING SUPPORT SYSTEM FOR A DYNAMOELECTRIC MACHINE.

3,826,592. SPLIT LOCKING PIECE FOR CIRCUMFERENTIAL DOVETAIL ON TURBINE WHEEL.

3,861,818. THRUST WEAR DETECTOR.

3,861,827. DIAPHRAGM SUPPORT LUGS.

3,864,803. CARTRIDGE BRUSH HOLDER.

3,866,073. COMPOSITE CONFORMABLE SUPPORT STRUCTURE ELEMENT.

3,878,868. EXPANSION JOINT.

3,885,420. METHOD AND APPARATUS FOR MEASURING SMALL VARIATIONS IN THE SPEED OF ROTATING SHAFTS.

3,886,387. FLUX SHIELD FOR DYNAMOELECTRIC MACHINES.

3,886,449. POWER MEASUREMENT CIRCUIT.

3,891,875. SUPERCONDUCTING ROTOR.

3,894,253. VERY HIGH CURRENT FIELD WINDING FOR DYNAMOELECTRIC MACHINE ROTOR.

3,903,442. ROTATABLE BUS RINGS FOR COLLECTORS.

3,906,265. HONEYCOMB STATOR INSERTS FOR IMPROVED GENERATOR COOLING.

3,911,731. NON-CONTACTING SELF-CALIBRATING VIBRATION SENSOR.

3,916,671. GAS CHROMATOGRAPHIC ANALYSIS OF PYROLYSIS PRODUCTS.

3,942,804. TURBOMACHINE SEAL.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below.

Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,954,272. SIGNAL PICKUP RETURN MECHANISM.

3,954,337. METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER.

3,954,404. DIPHENYL CONTINUOUS FOAM DYEING WITH FABRIC RUNNING OVER ROLLS IN FOAM BATH.

3,955,047. D.C. REINSERTION IN VIDEO AMPLIFIER.

3,955,095. METHOD AND APPARATUS FOR DETERMINING THE AVERAGE SIZE OF APERTURES IN AN APERTURED MEMBER.

3,955,108. TRANSISTOR AMPLIFIER STAGE WITH DEVICE IN ITS TEMPERATURE COMPENSATED BIAS NETWORK USED AS PRELIMINARY AMPLIFIER.

3,955,155. AMPLITUDE MODULATION SYSTEM.

3,955,158. MICROWAVE DELAY LINE.

3,955,160. SURFACE ACOUSTIC WAVE DEVICE.

3,956,535. METAL PLATED OR PLATABLE ARTICLE.

3,956,581. PICKUP ARM APPARATUS.

3,956,631. PROCESS FOR NON-DESTRUCTIVE INSPECTION.

3,956,715. AMPLITUDE MODULATION SYSTEM.

3,956,820. METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A LEAD BONDED TO A SURFACE THEREOF.

3,957,216. COIL WINDING MACHINE.

3,957,354. DIFFRACTIVE SUBTRACTIVE COLOR FILTERING TECHNIQUE.

3,958,135. CURRENT MIRROR AMPLIFIERS.

3,958,180. VARACTOR TUNER FREQUENCY CONTROLLER.

3,958,210. CHARGE COUPLED DEVICE SYSTEMS.
3,958,247. RF POWER COUPLING NETWORK EMPLOYING A PARALLEL PLATE TRANSMISSION LINE.
3,958,266. DEEP DEPLETION INSULATED GATE FIELD EFFECT TRANSISTORS.
3,959,025. METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR.
3,959,522. METHOD FOR FORMING AN OHMIC CONTACT.
3,959,747. METALLIZED LITHIUM NIOBATE AND METHOD OF MAKING.
3,959,807. PLANAR TRANSFERRED ELECTRON DEVICE WITH INTEGRAL NONLINEAR LOAD RESISTOR.
3,959,811. SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER.
3,947,934. METHOD OF TUNING A TUNABLE MICROELECTRONIC LC CIRCUIT.
3,948,468. REPLACEABLE SOLAR ARRAY PANELS.
3,949,146. PROCESS FOR DEPOSITING TRANSPARENT ELECTRICALLY CONDUCTIVE TIN OXIDE COATINGS ON A SUBSTRATE.
3,949,244. REFERENCE SIGNAL GENERATOR FOR TAPE TENSION SERVOMECHANISM.
3,949,390. HIGH VOLTAGE AEROSOL DETECTOR.
3,950,173. ELECTRON BEAM RECORDING ARTICLE WITH O-QUINONE DIAZIDE COMPOUND.
3,950,657. TIMER CIRCUITS.
3,950,669. ERASING METHOD FOR STORAGE TUBE EMPLOYING RASTER SCAN.
3,950,673. GATING CIRCUIT FOR TELEVISION SCR DEFLECTION SYSTEM.
3,950,708. GAIN-CONTROLLED AMPLIFIER.
3,950,720. ADJUSTABLE SPRING MOUNT FOR A CATHODE RAY TUBE YOKE.
3,951,663. ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA COMPRISING AN ALPHA DI-KETONE.
3,951,708. METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE.
3,951,846. NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES.
3,952,145. PICKUP ARM CARTRIDGE APPARATUS.
3,952,147. PICKUP ARM CARTRIDGE.
3,952,222. PICKUP TUBE TARGET.
3,952,224. IN-LINE ELECTRON GUNS HAVING CONSECUTIVE GRIDS WITH ALIGNED VERTICAL, SUBSTANTIALLY ELLIPTICAL APERTURES.
3,952,226. CRT COMPRISING STRONTIUM METAL GETTER FILMS AND METHOD OF PREPARATION.
3,952,257. CURRENT PROPORTIONING CIRCUITS.
3,952,586. DETERMINING ENGINE COMPRESSION FROM STARTER MOTOR CURRENT.
3,953,209. METHOD FOR PREPARING SUPPLEMENTAL FILTER FOR LIGHTHOUSE.
3,953,624. METHOD OF ELECTROLESSLY DEPOSITING NICKEL PHOSPHORUS-ALLOYS.
3,953,654. TEMPERATURE-STABLE NON-MAGNETIC ALLOY.
3,953,733. METHOD OF OPERATING IMAGERS.
3,953,743. LOGIC CIRCUIT.
3,953,767. GROUND FAULT DETECTION APPARATUS.
3,953,807. CURRENT AMPLIFIER.
3,953,809. INJECTION LASER MODULATOR.
3,953,822. WAVE-ENERGY IMAGING TECHNIQUE.
3,953,878. CONSTANT TEMPERATURE CONTROL FOR TRANSFERRED ELECTRON DEVICES.
3,941,630. METHOD OF FABRICATING A CHARGED COUPLE RADIATION SENSING DEVICE.
3,941,715. SUBSTITUTED ZIRCONIUM PYROPHOSPHATE PHOSPHORS.
3,941,940. TRANSIENT SUPPRESSOR.
3,942,046. LOW OUTPUT IMPEDANCE VOLTAGE DIVIDER NETWORK.
3,942,062. METAL VAPOR LASER DISCHARGE DEVICE.
3,942,129. CONTROLLED GAIN AMPLIFIER.
3,942,133. GAS LASER TUBE WITH STRAY LIGHT RESTRICTION.
3,942,134. ASTABLE MULTIVIBRATOR.
3,942,365. POWER TEST MEANS AND METHOD FOR INTERNAL COMBUSTION ENGINES.
3,942,378. FLUID FLOW MEASURING SYSTEM.
3,943,275. PRECISION TURNTABLE ROTATION IN A VACUUM ATMOSPHERE.
3,943,302. ELECTRON BEAM RECORDING IN THICK MATERIALS.
3,943,346. DIGITAL INTERPOLATOR FOR REDUCING TIME QUANTIZATION ERRORS.
3,943,347. DATA PROCESSOR REORDER RANDOM ACCESS MEMORY.
3,943,379. SYMMETRICAL ODD MODULUS FREQUENCY DIVIDER.
3,943,380. KEYED COMPARATOR.
3,943,469. MECHANICAL STRUCTURE FOR MOUNTING MICROWAVE DIODE PACKAGES.
3,943,491. ULTRASONIC DIGITAL RECEIVER.
3,943,512. SIDELOBE LOCK-ON DISCRIMINATING METHOD FOR SEARCH-TRACK MONOPULSE RADAR.
3,943,522. CIRCULARLY POLARIZED ANTENNA SYSTEM USING A COMBINATION OF TURNSTILE AND VERTICAL DIPOLE RADIATORS.
3,943,527. NONCONTACTING MARKER.
3,943,551. LSI ARRAY USING FIELD EFFECT TRANSISTORS OF DIFFERENT CONDUCTIVITY TYPE.
3,943,555. SOS BIPOLAR TRANSISTOR.
3,944,420. GENERATION OF PERMANENT PHASE HOLOGRAMS AND RELIEF PATTERNS IN DURABLE MEDIA BY CHEMICAL ETCHING.
3,944,684. PROCESS FOR DEPOSITING TRANSPARENT, ELECTRICALLY CONDUCTIVE TIN CONTAINING OXIDE COATINGS ON A SUBSTRATE.
3,944,859. BRIDGE-BALANCE DETECTION CIRCUIT.
3,944,883. RETRACE PULSE GENERATOR HAVING IMPROVED NOISE IMMUNITY.
3,944,926. TIMING TECHNIQUE FOR NRZ DATA SIGNALS.
3,944,936. ZERO CROSSOVER DETECTOR.
3,945,825. METHOD FOR PRODUCING WIDTH-MODULATED SURFACE RELIEF PATTERNS.
3,945,864. METHOD OF GROWING THICK EXPITAXIAL LAYERS OF SILICON.
3,945,902. METALLIZED DEVICE AND METHOD OF FABRICATION.
3,946,126. METHOD OF ELECTROLESS NICKEL PLATING.
3,946,274. SIDE PINCUSHION CORRECTION CIRCUIT.
3,946,325. TRANSISTOR AMPLIFIER.
3,946,327. AMPLIFIER EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS.
3,946,379. SERIAL TO PARALLEL CONVERTER FOR DATA TRANSMISSION.
3,946,429. SELF-FUSING TRANSCALENT ELECTRICAL DEVICE.
3,947,632. START-UP POWER SUPPLY FOR A TELEVISION RECEIVER.
3,947,717. PHOTOCONDUCTOR OF CADMIUM SELENIDE AND ALUMINUM OXIDE.
3,947,727. PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS.
3,947,773. CHANNEL NUMBER MEMORY FOR TELEVISION TUNERS.
3,947,781. LASER DEVICE.
3,947,793. MULTI-LAYER TOROIDAL DEFLECTION YOKE.
3,947,801. LASER-TRIMMED RESISTOR.
3,947,845. ALTITUDE CODING FOR COLLISIONS AVOIDANCE SYSTEM.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 19, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-8-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-29-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-16-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-4-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-19-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	4-1-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-23-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-16-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-19-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-31-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-3-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-9-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-25-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during July 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 704), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,893,005 to 2,897,499 inclusive

Plant Patents..... Numbers 1,850 to 1,855 inclusive

REISSUES

JULY 13, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,895

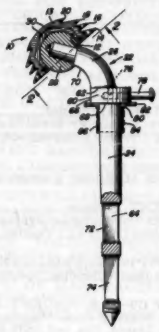
ARTIFICIAL HIP JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, Baltimore, Md.

Original No. 3,848,272, dated Nov. 19, 1974, Ser. No. 217,540, Jan. 13, 1972. Application for reissue May 19, 1975, Ser. No. 579,006

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.912 **24 Claims**



14. An artificial hip joint comprising: an acetabulum prosthesis of the cotyloid cavity defining an aperture having screw threads on the inner surface thereof;

at least one insert having an outer threaded surface and an inner bearing surface inserted into said aperture and threadedly connected by means of said threads to said acetabulum prosthesis to form a socket, the outer surface of said at least one inert engaging and being supported by the inner surface of said aperture; and

a prosthesis of the head of the femur movably interconnected with said acetabulum prosthesis and including a pin to be driven into the bone-marrow channel of the femur, a [curved] neck integral with the pin, and a hip ball positioned on the neck, movably located within said socket and in movable contact with said insert, said socket enveloping more than one-half of the hip ball to prevent withdrawal of the hip ball from the socket, said artificial hip joint composed of surgical grade materials suitable for implantation into the body.

Re. 28,896

CUTTING TOOL ASSEMBLY

Patrick J. Gleason, Lum, Mich., assignor to Lumco Manufacturing Company, Lum, Mich.

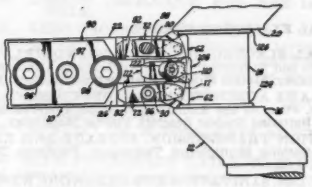
Original No. 3,760,425, dated Sept. 25, 1973, Ser. No. 280,600, Aug. 14, 1972. Application for reissue June 13, 1974, Ser. No. 478,912

Int. Cl.[2] B26D *1/00*

U.S. Cl. 29—97 **38 Claims**

1. A cutting tool assembly comprising a cutter body including a mounting surface and a cutting end having cutter blade mounting means on opposite sides thereof, each mounting means including a slot opening outwardly from the cutting end and being so arranged as to have a certain angular relationship with the mounting surface for establishing desired cutting angles; the cutter body also including a pair of inclined surfaces each displaced from a respective one of the pair of slots and being provided with an inclination having a predetermined relationship with the certain angular relationship of each of the pair of slots; a pair of side cutter blades respectively positioned within the slots so that in the operative position thereof the cutting edges thereof project from the side of the cutter body; a pair of front cutter blades respectively positioned within the slots so that in the operative position thereof each front cutter blade is in a certain cutting alignment relative to the other and a respective one of the side cutter blades and is also arranged so as to be in engagement with a respective one of the pair of side cutter blades; and a pair of clamp elements respectively adjustably positioned on the cutter body adjacent the pair of front cutter blades so as to have a predetermined angular relationship with a respective one of the pairs of slots, each clamp element in the clamping position thereof having an inclined surface in engagement with a respective one of the pair of inclined surfaces on the cutter body and a cutter blade engaging portion in engagement with a respective one of the pair of front cutter blades so as to maintain a respective one of the pair of front cutter blades and a respective one of the pair of side cutter blades in the operative positions thereof for cutting a certain profile.

18. A cutting tool assembly of the type that is fed in one direction into a workpiece during a single step machining operation to provide on the workpiece when the single step machining



operation is completed at least two distinct surfaces, comprising: a cutter body having at least one cutter blade mounting slot opening outwardly from said cutter body, said mounting slot having at least two sidewalls at least in part spaced from each other and converging generally rearwardly from the outward opening of said slot in a direction generally opposite to said one direction in which said cutter body is fed into a workpiece, first and second cutter blades each having a cutting edge thereon and sidewalls extending generally rearwardly of said cutting edge, said first and said second cutter blades being removably juxtaposed in said slot between the sidewalls thereof with said cutting edges displaced from each other to each produce in said single step machining operation a respective one of said two distinct surfaces, at least one of the cutter blades having a pair of sidewalls converging generally rearwardly from said outward opening of said mounting slot and rearwardly from its cutting edge in a direction generally opposite to said one direction with one of said converging sidewalls being juxtaposed with and bearing on a sidewall of the other cutter blade to wedge both said cutter blades between said two sidewalls of said mounting slot, and means retaining said one cutter blade in said mounting slot in engagement with said other cutter blade whereby both the cutter blades are retained on said cutter body by a wedging action of said one cutter blade.

Re. 28,897

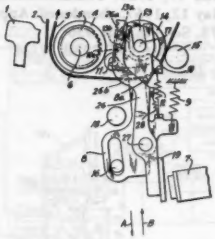
MOTION TRANSFORMING MECHANISM

Machito Natori, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan

Original No. 3,818,773, dated June 25, 1974, Ser. No. 378,357, July 11, 1973. Application for reissue Apr. 10, 1975, Ser. No. 567,227

Int. Cl.[2] F16H *27/00*

U.S. Cl. 74—112 7 Claims



1. A motion-transforming mechanism comprising a rotor, a reciprocatable member proximate said rotor and movable in first and second directions opposite to each other, first and second stops positioned for guiding and limiting the excursion of said reciprocatable member, a trunion mounted on said reciprocatable member, a cam member mounted pivotably on said trunion, said cam member having a contacting portion engageable with said rotor and having a camming portion, first spring means normally holding said contacting portion disengaged from said rotor, second spring means normally holding said reciprocatable member against said first stop, trigger means for rotating said contacting portion of said cam member into engagement with said rotor by exerting a [pulsed] force moment greater than the force moment exerted by said first spring means, said rotor rotating in such a direction that engagement of said contacting portion with said rotor moves said cam member and thereby said trunion and said reciprocatable member toward said second stop, and a guide proximate said cam member, said guide being so positioned that as said reciprocatable member carrying said cam member moves toward said second stop, said camming portion engages said guide, the shape of said camming portion being such that on engaging said guide, said cam member is rotated away from said rotor by movement of said reciprocating member toward said second stop, thereby disengaging said contacting portion [form] *from* said rotor [, said trigger means being adapted to terminate exertion of said pulse moment at or shortly after the disengagement of said contacting portion from said rotor thereby] *and* allowing said second spring means to draw said reciprocating member to said first stop, and said first spring means to hold said contacting portion disengaged from said rotor.

Re. 28,898

SELF-ALIGNING TRACTION ASSEMBLY FOR VEHICLES

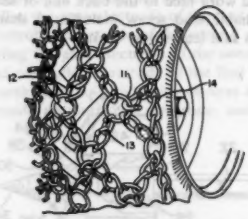
Roger L. Gower, 21 Coburn Ave., Skowhegan, Maine 04976

Original No. 3,768,534, dated Oct. 30, 1973, Ser. No. 214,067, Dec. 30, 1971. Application for reissue Apr. 16, 1975, Ser. No. 568,763

Int. Cl.[2] B60C *27/06*

U.S. Cl. 152—239 15 Claims

1. In a traction assembly for mounting upon the tire of a self-powered vehicle, a succession of rings connected together by lengths of chain having links unidirectionally distorted in the longitudinal plane thereof; said lengths of chain being so connected as to form a succession of polygonal patterns across the width of the tire, in such manner that tension exerted upon any part of such assembly creates reacting tension upon the remainder thereof, said assembly being susceptible of expansion either laterally or linearly and thus effecting a snug emplacement of said assembly upon the said vehicle tire.



Re. 28,899

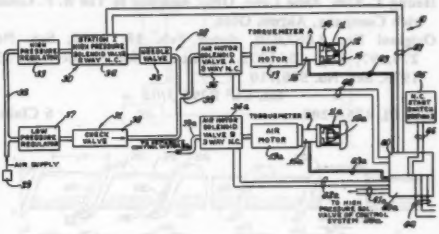
TORQUE CONTROL APPARATUS

Sydney Himmelstein, Lake Forest, and Richard S. Tveter, Barrington, both of Ill., assignors to S. Himmelstein and Company, Elk Grove Village, Ill.

Original No. 3,827,506, dated Aug. 6, 1974, Ser. No. 318,864, Dec. 27, 1972. Continuation-in-part of Ser. No. 288,379, Sept. 12, 1972, abandoned. Application for reissue Apr. 2, 1975, Ser. No. 564,272

Int. Cl.[2] B25B *23/14*

U.S. Cl. 173—12 30 Claims



1. In a torque-applying apparatus having torque means for forcibly threading a first threaded member into tightened association with a second threaded member, control means for controlling the operation of said torque means comprising:

seating means for causing said torque means to develop a force in threading the first member into a seated association with said second threaded member;

means for sensing the amount of torque applied between said threaded members; and

setting means responsive to said sensing means for causing said torque means to develop a gradually increasing higher [force] *torque* for applying a preselected maximum torque between said seated threaded members to provide a preselected tightened condition of said threaded members.

Re. 28,900

DRILL BIT DEVICE

John E. Byers, 2130 Choteau St., Helena, Mont. 59601, and Wells H. Claussen, 4523 S.W. Seattle St., Seattle, Wash. 98116

Original No. 3,687,565, dated Aug. 29, 1972, Ser. No. 119,525, Mar. 1, 1971. Application for reissue Aug. 26, 1974, Ser. No. 500,341

Int. Cl.[2] B23B *51/00, 51/02*

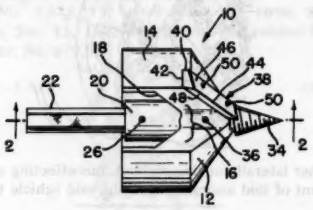
U.S. Cl. 408—201 19 Claims

1. A boring [took] *tool*, comprising

a. a generally circular drill bit body having a work face and a back end, said work face defining a substantially cone-

shaped surface extending rearwardly and outwardly at an angle of about 30°, said body also having a lead screw cavity in said work face generally centrally thereof and a pair of generally opposed cut-away segments extending from said work face to the back end of said body,

b. a detachable lead screw including a shank portion received in said lead screw cavity,



c. said body also having a center section extending rearwardly and including a shaft cavity for mounting said body on a shaft for rotation by drill means,

d. a cutting edge means in each of said segments, and

e. means in the center section of said body for detachably securing said lead screw to said body and said body to said shaft.

Re. 28,901

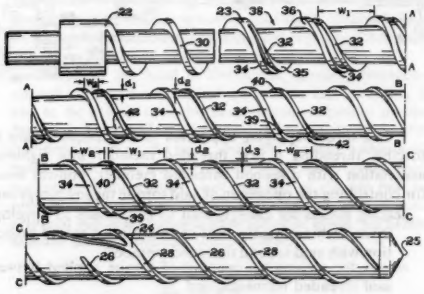
APPARATUS FOR REFINING POLYMERIC MATERIAL

Heung T. Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Original No. 3,867,079, dated Feb. 18, 1975, Ser. No. 279,697, Aug. 10, 1972. Application for reissue Apr. 23, 1975, Ser. No. 570,710

Int. Cl.² B29F *3/02*

U.S. Cl. 425—208 **6 Claims**



1. In a machine for processing polymeric material comprising a cylinder; said cylinder having die means at one end thereof; a feed screw rotatably mounted in said cylinder and extending longitudinally therethrough for moving plastic material therethrough to progressively change said plastic material from the solid phase to a fluent phase for extrusion therefrom; said feed screw having first means for operatively exerting continuous pressure on said plastic material for moving said plastic material; second means integral with said feed screw for continuously leading off the fluent phase progressively from said first means as the plastic material is changed from the solid phase by contact with said cylinder, said fluent phase being directed away from and not through the remaining solid phase; [and] said first means defines a groove having a constant axial width with decreasing radial depth in the direction of said die means providing a constant amount of surface area exposed to said cylinder for material carried by said groove; *and said second means defines a second groove having an increasing axial width with increasing radial depth in the direction of said die means.*

Re. 28,902

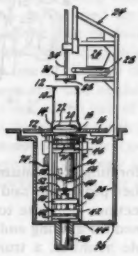
VIBRATORY CORE FOR CONCRETE PIPE MAKING MACHINE

Ferdinand A. Trautner, Wellesley Hills, Mass., and LeRoy E. Kent, Sioux City, Iowa, assignors to Concrete Pipe Machinery Company, Sioux City, Iowa

Original No. 3,752,626, dated Aug. 14, 1973, Ser. No. 867,344, Oct. 17, 1969. Continuation-in-part of Ser. No. 638,010, May 12, 1967, abandoned. Application for reissue Aug. 1, 1975, Ser. No. 601,036

Int. Cl.² B28B *21/28*

U.S. Cl. 425—262 **22 Claims**



1. In a concrete pipe forming apparatus adapted for forming pipe from zero-slump concrete including a pipe form, a platform for supporting said pipe form, a rotating packerhead material distributor comprising a rollerhead for forming the pipe, and a powered main lift mechanism for raising said rollerhead as the pipe is formed, the improvement comprising:

a. a non-rotating core;

b. means for vibrating material forming the pipe as the pipe is formed;

c. means interengaging said core with said rollerhead; and

d. an upwardly movable guide system for said core [.] , *said means for vibrating material forming the pipe as the pipe is formed comprising means attached to the core for vibrating the core.*

Re. 28,903

PHOSPHATIDE SEPARATION

Rajindra Aneja, Welwyn Garden City, and Jaswinder Singh Chadha, London, both of England, assignors to Lever Brothers Company, New York, N.Y.

Original No. 3,752,833, dated Aug. 14, 1973, Ser. No. 175,731, Aug. 27, 1971. Application for reissue Nov. 25, 1974, Ser. No. 526,764

Claims priority, application United Kingdom, Sept. 23, 1970, 45295/70

Int. Cl.² A23J *7/00*; C07F *9/02*

U.S. Cl. 260—403 **14 Claims**

1. A process for separating an N-acylcephalin and a phosphatide without an acylatable amino group from a mixture comprising them which comprises adding to the mixture a sufficient amount of an acid to provide the equivalent of pH less than 3.5 under aqueous conditions, extracting the mixture with acetone or methyl acetate, and separating the phases containing the N-acylcephalin and the phosphatide without an acylatable amino group.

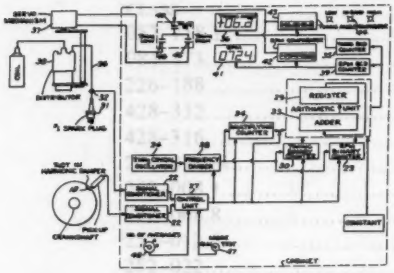
Re. 28,904
METHOD AND APPARATUS FOR TESTING INTERNAL COMBUSTION ENGINES

Richard C. Maisonville, Detroit, Mich., assignor to Scans Associates, Inc., Livonia, Mich.

Original No. 3,763,420, dated Oct. 2, 1973, Ser. No. 200,974, Nov. 22, 1971. Application for reissue Sept. 29, 1975, Ser. No. 617,366

Int. Cl.² F02P *17/00*

U.S. Cl. 324—16 R **37 Claims**



24. A method of measuring the timing angle of an internal combustion engine having at least one cylinder, a piston, a spark plug, and a crankshaft connected to said piston; selecting one cylinder as the base cylinder, running the engine and determining the time required for one full and exact revolution of the engine from top dead center to top dead center, simultaneously determining the time elapsed between the firing of the spark plug in said base cylinder and the moment the piston in said base cylinder reaches its top dead center position, determining the time required for one degree of engine rotation for the revolution of the engine just measured, and dividing the time elapsed between the spark plug firing and the moment the piston in said base cylinder reaches its top dead center position by the time required for one degree of engine rotation, thereby determining the timing angle.

Re. 28,905
FIELD EFFECT TRANSISTOR MEMORY CELL

David Albert Hodges, Berkeley, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,540,007, dated Nov. 10, 1970, Ser. No. 676,491, Oct. 19, 1967. Application for reissue Aug. 24, 1971, Ser. No. 174,571

Int. Cl.² G11C *13/00, 11/40*

U.S. Cl. 340—173 R **20 Claims**

1. A memory cell comprising:

first and second unipolar conducting devices each having a gate electrode and first and second controlled electrodes,

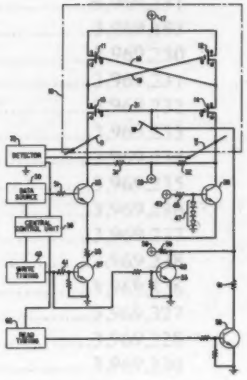
a source of reference potential,

means applying the reference potential to the first controlled electrode of the first device and to the first controlled electrode of the second device,

means coupling the gate electrode of the first device to the second controlled electrode of the second device.

means coupling the gate electrode of the second device to the second controlled electrode of the first device,

third and fourth unipolar conducting devices each having a gate electrode, a controlled electrode, and a threshold voltage,



means coupling the controlled electrode of the fourth device to the second controlled electrode of the second device,

a source producing three different potential level signals, all of said level signals having a potential different from the reference potential by a magnitude exceeding the threshold voltage of the third and fourth devices, and

means coupling the three level source to the gate electrodes of the third and fourth devices,

means coupling the controlled electrode of the third device to the second controlled electrode of the first device,

PATENTS

GRANTED JULY 13, 1976

ERRATA

For CLASS	See PATENT NO.
052–758 F	3,968,624
084–473	3,968,721
226–188	3,968,920
428–332	3,969,130
428–316	3,969,131
204–014 N	3,969,195
252–008.1	3,969,230
252–008.8	3,969,231
252–012.6	3,969,232
252–022	3,969,233
252–033	3,969,234
252–042.7	3,969,235
252–049.5	3,969,236
252–049.9	3,969,237
252–062.1 L	3,969,238
526-011.1	3,969,326
526–001	3,969,327
526–320	3,969,328
526–014	3,969,330
526–066	3,969,331
526–128	3,969,332
526–154	3,969,333
526–017	3,969,334
526–154	3,969,335
260–287 T	3,969,463
260–395	3,969,464
260–527	3,969,465
260–554	3,969,466
260–570.9	3,969,467
260–574	3,969,468
260–891	3,969,469
260–897 A	3,969,470
426–005	3,969,513
426–090	3,969,514
252–457	3,969,542
264–284	3,969,565
174–035 MS	3,969,572
178–066 R	3,969,590
200–314	3,969,609
250–527	3,969,631

PATENTS

GRANTED JULY 13, 1976

ERRATA

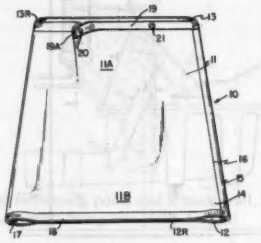
Class	Patent No.
052-758 F	3,968,954
084-477	3,968,721
220-188	3,968,920
428-332	3,969,130
428-416	3,969,131
204-016 H	3,969,195
252-008 I	3,969,230
252-008.8	3,969,231
252-012.6	3,969,232
252-022	3,969,233
252-032	3,969,234
252-042.7	3,969,235
252-046.5	3,969,236
252-049.9	3,969,237
252-052 I.C.	3,969,238
256-011.1	3,969,258
256-001	3,969,327
256-220	3,969,328
256-014	3,969,330
256-066	3,969,331
256-128	3,969,332
256-134	3,969,333
256-017	3,969,334
256-134	3,969,335
260-237 T	3,969,464
260-293	3,969,484
260-327	3,969,485
260-334	3,969,486
260-239.9	3,969,487
260-334	3,969,488
260-891	3,969,489
260-402 A	3,969,490
256-005	3,969,513
428-090	3,969,574
252-427	3,969,582
264-284	3,969,583
174-035 AS	3,969,572
174-050 R	3,969,590
260-314	3,969,609
250-527	3,969,621

PATENTS

GRANTED JULY 13, 1976

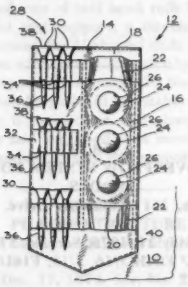
GENERAL AND MECHANICAL

3,968,521
COMBINED HEAD AND NECK WEAR
Joy Anne Bashlow, 54 Sherman St., Passaic, N.J. 07055
Filed Feb. 26, 1973, Ser. No. 335,646
Int. Cl.² A42B *1/04*
U.S. Cl. 2—203 **9 Claims**



1. A protective garment for covering the head, neck, and shoulders of a wearer and for allowing the wearer's face to be exposed, and appropriate also for wearing in a fashion to cover only the shoulders and surround the neck and not cover the head, said protective garment comprising a truncated conically shaped sleeve of flexible material having a large diameter open end and a small diameter open end; said truncated conical sleeve having a trapezoidal cross-section at all cross-sections of said sleeve through both of its said open ends; said truncated conical sleeve having a length longer than the distance from just below the shoulder of a wearer to the top of the head of the wearer; said large diameter end having a periphery large enough to fit snugly around the shoulders of a wearer; said small diameter end having a periphery large enough to snugly receive the face of a wearer; said protective garment, when worn as a hood, having a plurality of randomly spaced folds along the lower edge, said folds constituting a draping.

3,968,522
GOLF BALL POCKET AND IMPROVED GOLF GARMENT
Karl Riess, 800 N. Mariposa Ave., Los Angeles, Calif. 90029
Filed Sept. 12, 1975, Ser. No. 612,848
Int. Cl.² A41D *27/20*
U.S. Cl. 2—250 **18 Claims**

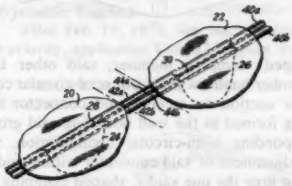


1. An improved golf ball pocket, said pocket being adapted for securing to the exterior of a garment, said pocket comprising, in combination.

a. a flexible front sheet of extended surface area shaped to define an open-bottomed and open-topped closed sided golf ball-receiving tube; and

b. elastic means secured to one side of said front sheet and releasably closing said open top and said open bottom of said tube.

3,968,523
METHOD FOR PRODUCING A ZIPPER CLOSABLE GARMENT POCKET AND A POCKET PROVIDED THEREBY
Sydney Newman, 1245 Avenue X, Brooklyn, N.Y. 11235
Filed Jan. 20, 1975, Ser. No. 542,224
Int. Cl.² A41D *27/20*
U.S. Cl. 2—252 **10 Claims**

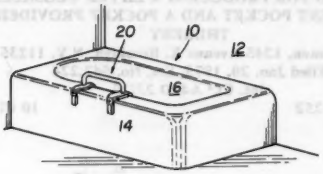


1. A method for mass producing in a plurality of garments at predetermined pocket locations therein closable pocket entries each having a zipper closure means therefor comprising the steps of initially providing a unitary substantially continuous fastener tape means having a spaced apart pair of substantially continuous zipper teach chains along each of a pair of the outermost longitudinally extending extremities thereof; securing said continuous zipper fastener tape means to said plurality of garments at said predetermined locations adjacent each of said zipper teeth chains with said securements for each of said zipper teeth chains being spaced apart; cutting each of said plurality of garments at said predetermined locations of said secured zipper fastener tape to each provide a substantially continuous slit for said pocket entry, said fastener tape means and each of said garments being longitudinally slit along the longitudinal axis of said fastener tape means to provide a secured spaced apart pair of opposed extremity zipper teeth chains at each of said pocket entry slits, the width of each of said pocket entry slits being dependent on said zipper teeth chain securement spacing; bending each of said pair of opposed extremity zipper teeth chains until said pair of zipper teeth chains are in opposed adjacent relationship; providing means on said opposed adjacent zipper teeth chains for completing the formation of said secured closable zipper at said pocket entry for providing said zipper closure means therefor; and thereafter cutting said plurality of garments at each of said secured fastener tape means at the extremities of each of said pocket entry slits to simultaneously separate said garments into individual separate garments while providing finished individual separate pocket entry zipper closures therefor; whereby the finishing of the individual zipper pockets also serves to separate the plurality of garments into individual separate garments.

3,968,524
BATHTUB SAFETY GRIPPING RAIL
Leo Zentman, c/o Orthopedic Splints, Inc., 147 Albany Ave., Lindenhurst, N.Y. 11757
Filed Nov. 13, 1975, Ser. No. 631,455
Int. Cl.² A47K *3/12*
U.S. Cl. 4—185 H **5 Claims**

1. In combination, a safety gripping rail for attachment to a bathtub wall of the type including a substantially U-shaped body adapted to be oriented in alignment with said bathtub

wall with opposite ends thereof in fixed position in relation to said bathtub wall, and a clamp for achieving said fixed position of each said rail body opposite end, each said clamp comprising a cooperating pair of L-shaped clamping members slidably interconnected for closing movement when positioned transversely of said bathtub wall against opposite surfaces of said bathtub wall, an elongated connector having threads therealong operatively associated with one said L-shaped clamping member, and threads for threadably engaging said elongated connector operatively arranged on said



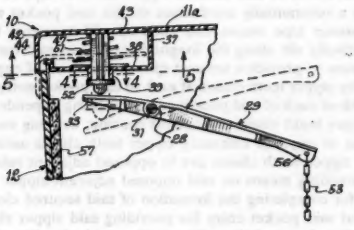
other L-shaped clamping member, said other L-shaped clamping member having a groove of semi-circular configuration in cross section to receive said connector and said threads being formed in the wall bounding said groove and of a corresponding semi-circular configuration, whereby threadable adjustment of said connector within said threads is effective to urge the one said L-shaped clamping member through closing movement in relation to said other L-shaped clamping member to achieve clamping engagement of said clamps to said bathtub wall.

3,968,525

ACTUATING MEANS FOR WATER CLOSET FLUSH TANK

Fred C. Alexander, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.

Filed Dec. 5, 1974, Ser. No. 529,720
Int. Cl.² E03D *1/012*
U.S. Cl. 4—67 R **4 Claims**



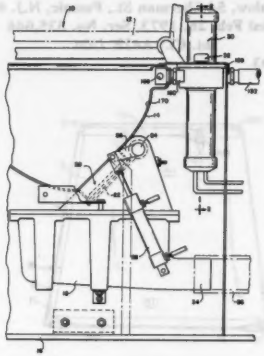
1. In combination, a flush tank having a discharge outlet and a flush valve controlling said discharge outlet, a lever pivoted intermediate its ends to a wall of said tank, means connecting one end of said lever to said flush valve, a removable cover for said tank, said cover including a top wall and a depending peripheral flange, said cover having a recess of substantial area in said top wall at a corner thereof, said recess being defined by vertical and bottom wall portions with the bottom wall portion having an aperture therein, an actuating member of similar substantial area movable in said recess, said actuating member including a depending stem slidable in said aperture, the lower end of said stem engaging the other end of said lever, the outer surfaces of said actuating member when said member is disposed in non-operating position being substantially co-planar with corresponding adjacent outer surfaces of said top wall and depending flange and means for biasing said actuating member to non-operating position.

3,968,526

FLUSH TOILET AND METHOD

Robert E. Harrah, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.

Filed Aug. 21, 1974, Ser. No. 499,114
Int. Cl.² E03D *5/012*
U.S. Cl. 4—79 **9 Claims**



1. In a combination toilet particularly adapted for mobile use, wherein a bowl portion is supported above a base chamber and cooperating means are provided to introduce water to flush said bowl portion and to introduce compressed air to discharge the contents of said base chamber, and wherein fluid communication between said bowl portion and base chamber is regulated by sealing means movable between a closed position sealing said bowl portion from said base chamber and an open position providing communication therewith: the improvement, comprising, unitary spool valve means to selectively and sequentially control the operations of said movable sealing means and said cooperating means to introduce water to said bowl portion and air to said base chamber of the toilet, said spool valve means including conduit means to effect air discharge of said base chamber only at such time as said movable sealing means is in said closed position to prevent passage of water or air between said bowl portion and said base chamber of the toilet, and means to actuate said spool valve means to sequentially control the movement of said sealing means to said open position, the introduction of flush water to said bowl portion, the closing of said sealing means, the introduction of air to said base chamber, the termination of water introduction to said bowl portion, and the termination of air introduction to said base chamber.

3,968,527

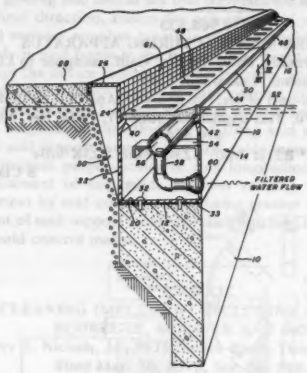
PERIMETER OVERFLOW SYSTEM FOR SWIMMING POOLS

William D. Hough, 2611 Poinsettia Drive, McKeesport, Pa. 15131

Filed May 21, 1975, Ser. No. 579,314
Int. Cl.² E04H *3/16, 3/18;* **F16L** *21/02*
U.S. Cl. 4—172.17 **9 Claims**

1. In a swimming pool construction of the type having side walls, and a gutter extending along the top of the side walls around the periphery of the swimming pool; the improvement in said swimming pool construction wherein said gutter is formed in sections of non-metallic plastic material joined end-to-end by pliable gaskets and mounted on top of said side

wall, each of said gutter sections having a front wall facing said swimming pool, a bottom wall resting on the top of the side

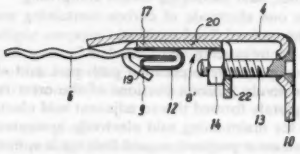


walls of said swimming pool, and a back wall, the front, bottom and back walls being integrally formed.

3,968,528
BEDSTEAD HAVING A WOVEN SUPPORT

Jannes Jonge Poerink, 25 Prins Bernardlaan, Borne, Netherlands

Filed Apr. 23, 1974, Ser. No. 463,645
Claims priority, application Germany, Apr. 26, 1973, 2321037
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—211 **5 Claims**



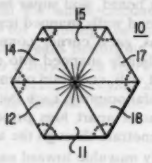
1. Bedstead comprising crossheads between which a woven mat support is stretched, said mat being made of spring steel wire, preferably plastic coated, and including longitudinal wire members having U-shaped ends, hook rails carried by said crossheads each having a row of spaced apart V-shaped hook members with recesses therebetween, the hook members of one hook rail pointing towards the hook members of the other hook rail, one of said hook rails being adjustable so as to tension said mat support, a double folded U-shaped clamping bar encasing the U-shaped ends of the longitudinal wire members, the wire receiving open edge of said U-shaped clamping bar being nested in and facing the closed ends of the V-shaped hook members of said adjustable hook rail such that a clamping force is exerted on said clamping bar and said U-shaped ends by said V-shaped hook members in proportion to tension force applied to said mat support by the adjustable hook rail.

3,968,529
PILLOW STRUCTURE

Martin Levin, and Selene Levin, both of 333 W. 56th St., New York, N.Y. 10019

Filed Dec. 17, 1974, Ser. No. 533,512
Int. Cl.[2] A47G *9/00*; A47C *27/00*
U.S. Cl. 5—338 **1 Claim**

1. A manipulative arrangement comprising a plurality of stuffed triangular sections interconnected in a chain including a first and a last section wherein said chain is folded to form an overall hexagon shape, said chain being foldable into a plurality of groups such that said first and last sections are in close proximity to form an overall geometrical shape, said first and last section being attached to one another in a manner to permit the manipulation of some of said sections from one to

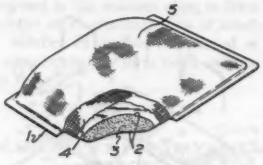


another of said groups and to preserve said shape wherein said sections are manipulated about an axis and said sections have sides of equal lengths transverse to said axis.

3,968,530
BODY SUPPORT MEANS

Reginald Dyson, Bath, England, assignor to G. D. Searle & Co., High Wycombe, England

Filed Feb. 19, 1974, Ser. No. 443,606
Claims priority, application United Kingdom, Feb. 24, 1973, 9193/73
Int. Cl.[2] A47G *9/00*; A47C *27/08*
U.S. Cl. 5—338 **7 Claims**

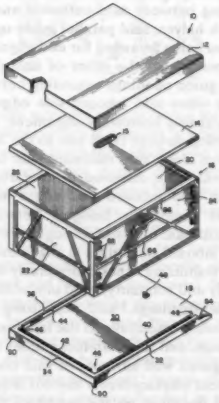


1. Body support means comprising:
a flexible, fluid-impermeable container;
a viscous fluid within said container and
a plurality of particles dispersed throughout said fluid, wherein said particles have a size distribution in the range from 0.01 to 15 millimeters in diameter and the volume ratio of said particles to said fluid is between about 70:30 and 95:5, said particles consist of a mixture of polystyrene beads and hollow silica beads and the viscosity of said fluid is between about 10,000 to 20,000 centipoises.

3,968,531
MOLDED PLASTIC BEEHIVE

Patrick E. Cartwright, R.R. No. 1, Seymour, Ind. 47274

Filed Dec. 18, 1974, Ser. No. 533,929
Int. Cl.[2] A01K *47/00*
U.S. Cl. 6—1 **6 Claims**



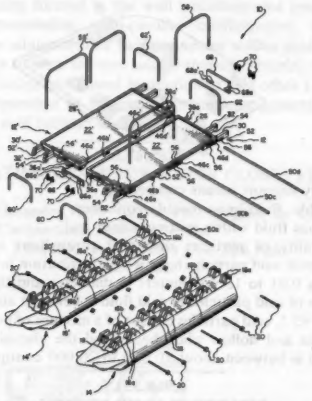
1. A beehive comprising a molded plastic bottom board, a molded plastic super mounted upon said bottom board, a

molded plastic inner cover for said super, and a molded plastic top cover for said hive, said top cover being substantially identical to said bottom board, said super including opposite side walls and opposite end walls snapped together to provide four corner connections, each corner connection including tenons on one wall resiliently snapped into engagement with openings in the adjacent wall, each said opening being a vertically elongated rectangular opening, each said tenon including a pair of vertically spaced apart lugs projecting outwardly from said one wall to penetrate through the adjacent opening, said lugs being resiliently movable toward each other, at least one of said lugs being formed with a vertically inclined camming surface which engages said opening as said lugs are penetrated into said opening to move said one lug vertically toward the other lug, said camming surface terminating with a hook which moves vertically as said camming surface passes through said opening to engage said adjacent wall.

3,968,532
KNOCK DOWN BOAT CONSTRUCTION

Alfred Bailey, Orchard Park, N.Y., assignor to Kar-Ta-Craft Corporation, East Aurora, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,214
Int. Cl.² B63B 7/00
U.S. Cl. 9—2 C **8 Claims**

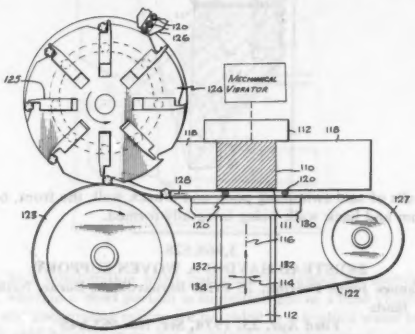


1. A knock down boat construction including a pair of generally rectangular deck halves each having fore and aft edges and outboard and inboard side edges, each of said deck halves having means defining a plurality of parallel guide openings of essentially square cross section, said parallel guide openings extending between said outboard and inboard side edges of said deck halves, said parallel guide openings of one of said deck halves being arranged for end alignment with said parallel guide openings of the other of said deck halves to form continuous guide openings extending between said outboard side edges when said inboard side edges are brought together in vertical and horizontal alignment; a pair of pontoon boat supporting devices fixed one to the bottom of each of said deck halves along said outboard side edges, whereby said pontoon devices are disposed in an essentially parallel relationship when said inboard side edges are disposed in alignment; means removably bridging between said deck halves adjacent both said fore and aft edges thereof for removably locking said inboard side edges in alignment; and a plurality of cylindrical stabilizing tubes transversely dimensioned to be loosely slidably and rotatably fitted one within each of said continuous guide openings, said stabilizing tubes having lengths corresponding essentially to the lengths of said continuous guide openings, and said stabilizing tubes being automatically clamped against wall surfaces of said continuous guide openings to prevent displacements thereof lengthwise of said continuous guide openings by the tendency of said inboard side edges to move from alignment in a direction downwardly and about said pontoon devices associated with their respective deck halves upon the application of loading to the upper surfaces of said deck halves.

3,968,533
FASTENER MANUFACTURING APPARATUS

Richard L. Reynolds, Palos Verdes, Calif., assignor to Litton Fastening Systems, Lakewood, Calif.

Continuation-in-part of Ser. No. 353,449, April 23, 1973, Pat. No. 3,894,570. This application June 17, 1974, Ser. No. 479,650
Int. Cl.² B21H 3/00; B23G 9/00; B23K 9/04
U.S. Cl. 10—2 **8 Claims**



1. In an apparatus for producing self-tapping threaded fasteners from metallic fasteners which have been formed with complete helical, crested threads upon a shank,

means for hardening at least portions of the threads of said fastener, said hardening means comprising:

at least one electrode of carbon-containing material in a predetermined fixed position;

means for advancing said threaded fastener in rolling motion along a predetermined path past said electrode to successively position portions of the crest region of its completely formed thread adjacent said electrode;

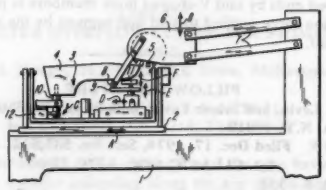
means for maintaining said electrode in contact with said thread crest portions as said fastener is rolled along said predetermined path for hardening said thread portions around the periphery of said fastener; and

means for applying a potential difference between said threaded fastener and said electrode.

3,968,534
DEVICE FOR USE IN THE MANUFACTURE OF SHOES

Dieter Braun, Stuttgart, Germany, assignor to Fortuna-Werke Maschinenfabrik AG, Stuttgart, Germany

Filed Jan. 27, 1975, Ser. No. 544,673
Claims priority, application Germany, Jan. 25, 1974, 2403535
Int. Cl.² A43D 3/00
U.S. Cl. 12—127 **10 Claims**



1. In a device for use in manufacture of shoes; a frame, support element in the frame engageable with the heel end of a last in inserted position of the last, a support member in the frame for engagement with the tip end of the last, a tool in the

frame operatively engageable with a shoe on the last, a guide member in the frame adjacent said support member operable for guiding said tool as the tool traverses the shoe in the longitudinal direction, means for adjusting said support element and support member together with said guide member relatively in said frame in the longitudinal direction of the last to adapt the device to lasts of different sizes, and control means responsive to movement of said support element and said support member together with said guide member relatively in the longitudinal direction for adjusting said support element and said support member and said guide member relatively in a direction perpendicular to said longitudinal direction, the adjustment of said guide member relative to said support element by said control means being greater than the adjustment of said support member relative to said support element by said control means.

3,968,535

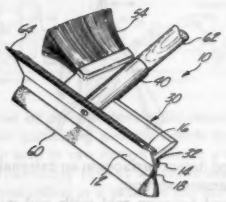
CLEANING IMPLEMENT INCLUDING A SPONGE, SQUEEGEE, SCRAPER AND BRUSH

Harry S. Nichols, Jr., 5675 Sussex Road, Troy, Mich. 48084

Filed Mar. 20, 1975, Ser. No. 560,300

Int. Cl.² A47L *1/08, 23/04;* **B60S** *1/04*

U.S. Cl. 15—105 **4 Claims**



1. A multiple purpose cleaning device to be employed in washing, squeegeeing, and brushing accumulations off windshields of vehicles carrying an integral scraping surface for cleaning debris from the soles and heels of shoes comprising:

a sponge;

a window squeegee;

a plate comprising an elongated edge on one side with means for mounting the sponge and an elongated edge on the opposite side with means for mounting the window squeegee;

a T-shaped attachment comprising a handle carrying cylindrical portion;

a brush holder portion carried adjacent to and integrally formed with the cylindrical portion;

a shoe scraper carried adjacent to and integrally formed with the cylindrical portion opposite the brush holder portion, the scraper extending upwardly from the plate substantially at right angles thereto;

means on the attachment for joining it to the plate;

a brush carried by the brush holder portion with its bristles extending laterally of the cylindrical portion;

a handle carried by the handle-carrying cylindrical portion; and

a means on the plate for receiving the T-shaped attachment.

3,968,536

HAIRBRUSH

Harold Leighton, London, and William John Gullis, Sandwich, both of England, assignors to Harold Leighton, London, England

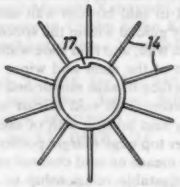
Filed Feb. 6, 1975, Ser. No. 547,461

Int. Cl.² A46B *9/10*

U.S. Cl. 15—187 **4 Claims**

1. A hairbrush comprising:

a shank, a handle extending rearward from said shank, a plurality of annular members detachably disposed on said shank, each member having a plurality of unitary, semi-rigid bristles extending radially therefrom and equally spaced about the whole circumference of the member, and means for securing the annular members against rotation, said means permitting mounting of each member in either a forward or rearward manner, said means including an eccentric keying arrangement so that said bristles on an annular member mounted in a forward



manner are relatively angularly displaced with respect to bristles or an annular member mounted in a rearward manner, wherein bristles of a number of adjacent elements mounted in like manner align to form a predetermined number of longitudinal rows of bristles, and bristles of a number of members mounted in alternately opposite manner align to form twice said predetermined number of rows.

3,968,537

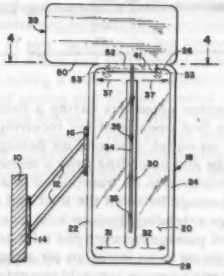
WIPING BLADE DEVICE FOR TRUCK REAR VIEW MIRRORS

John Joseph Wagenhofer, Chicago, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sept. 25, 1974, Ser. No. 509,044

Int. Cl.² B60S *1/24, 1/08*

U.S. Cl. 15—250.29 **2 Claims**



1. A detachably mounted wiping device for cleaning off rear view and side view mirrors of vehicles in which the mirrors are supported outwardly from the vehicles and are of substantial surface area expanse, said device comprising wiper support stem means, for carrying a wiper blade means, main wiper housing means, motor means in said main wiper housing means for driving said wiper support stem means, reciprocating coupling means for connecting said motor means to said wiper support stem means for reciprocally moving said wiper blade means back and forth in a horizontal direction over said mirrors, said main wiper housing means comprising a top wall, a bottom wall, two end walls, and two side walls defining an enclosed main housing chamber for blocking entrance of rain and snow into said chamber, motor mounting means in said chamber for supporting said motor means, said chamber having a narrow elongated opening formed in said bottom wall thereof for extension therethrough of said wiper support stem

means, said motor means comprising rotatable drive shaft means, cam drive wheel means carried by said drive shaft means for rotation therewith, said reciprocating coupling means comprising wrist pin means carried on said cam drive wheel means for rotation therewith, sliding bar means carried by said wiper blade stem means, connecting rod means coupling said wrist pin means with said sliding bar means for causing said wiper blade stem means to undergo reciprocal wiping motion upon rotation of said drive shaft of said motor means, guide plate means supported in said main chamber and mounted parallel to said bottom wall said sliding bar means being horizontally guided within the space between said guide plate, said bottom wall, and said slide walls to provide reciprocating movement of the stem and wiper blade in a direction parallel to the surface of said mirror and for maintaining said blade in engagement with said mirror surface, channel rail means carried by said bottom wall of said housing means for engaging an upper top edge margin portion of said mirror, and releasable clamp means on said channel rail means for holding said mirror in adjustable relationship to said housing means for providing lateral position adjustment of said housing with respect to said mirror.

3,968,538

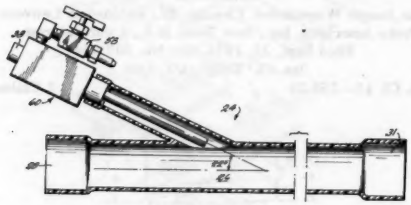
DOUBLE SUCTION UNIT

Owen F. Dunne, Tiverton, R.I., assignor to Clevepak Corporation, New York, N.Y.

Division of Ser. No. 449,082, March 7, 1974, Pat. No. 3,853,079. This application Sept. 30, 1974, Ser. No. 510,573

Int. Cl.² A47L *5/18*

U.S. Cl. 15—409 **7 Claims**



1. A dual suction apparatus having a first air passage extending from a first open inlet for receiving material to be transported to an outlet, a second air passage separate from said first passage and extending from a second open inlet for also receiving material to be transported to an outlet opening into said first passage between the inlet and outlet thereof, a third air passage extending from an inlet to an outlet opening into said second passage between the inlet and outlet thereof at such an angle so as to inject an air stream at a pressure above atmospheric pressure into said second passage to transfer momentum to the air therein, and to cause air to flow between the inlet and outlet of said second passage, said air flow in said second passage being injected into said first passage at such an angle so as to transfer momentum to the air therein to cause air to flow between the inlet and outlet of said first passage, and means coupled to said inlet of said third passage for supplying said air stream at a pressure above atmospheric pressure.

3,968,539

ADJUSTABLE HANDLE FOR AN INSTRUMENT CASING

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Oct. 10, 1975, Ser. No. 621,482

Int. Cl.² A47B *95/02;* **B65D** *25/28*

U.S. Cl. 16—115 **8 Claims**

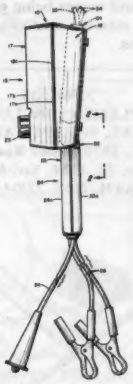
1. An adjustable handle for a casing comprising:

a gripping section movably secured to the casing for supporting the casing and an extension section extending from one end of said gripping section;

a pair of bearing projections extending from opposite sides of said handle extension section;

a pair of spaced walls supported by said casing and having curved surfaces for receiving one side portion of said projections;

a pair of cover caps for securing each of said projections to said casing at the opposite sides of said extension section, each of said caps having a curved surface portion for receiving the other side portion of said projections;



spaced, curved detent surfaces in an external surface of said handle extension section;

a roller located between said walls and movable into engagement with said curved surfaces; and

a spring wire extending through said roller and supported by supports attached to said casing;

said spring wire causing said roller to roll on the surface of said extension and to enter one of the curved detent surface in order to hold said handle relative to the casing when the handle is in a selected position.

3,968,540

FURNITURE HINGE FOR A GROOVED DOOR

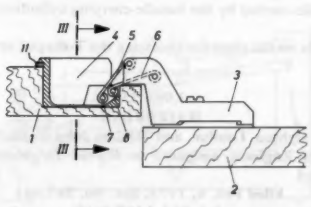
Karl Lautenschläger, Reinheim, Odw., and Gerhard Lautenschläger, Wersau, Odwo, both of Germany, assignors to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Odw., Germany

Filed June 20, 1975, Ser. No. 588,980

Claims priority, application Germany, Sept. 18, 1974, 2444569

Int. Cl.² E05D *3/06*

U.S. Cl. 16—163 **2 Claims**



1. A furniture hinge for a grooved door comprising:

a door engagement portion constituting a slip-on mount;

a quadrilateral link connected to said slip-on mount including two pivot pins disposed at a door side of said mount,

and two control levers positioned within a lower half of said slip-on mount on said pivot pins;

a retaining flange formed at a lower end of said slip-on mount;

at least one washer is mounted beneath and contacting said flange; and

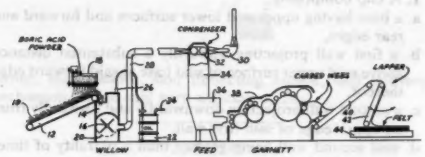
said slip-on mount being formed with a mouth and having a jacket beneath said control levers formed with a slot extending from said mouth of said slip-on mount, said slot having a width and depth such that said control levers pass therethroughout when opening the door.

3,968,541

PROCESS FOR MANUFACTURING FIRE-RETARDANT COTTON FELT

Emil B. Rasmussen, 10408 Newville Ave., Downey, Calif. 90241

Filed Sept. 4, 1974, Ser. No. 503,106
Int. Cl.² D01G *15/06, 29/00, 37/00*
U.S. Cl. 19—66 R **2 Claims**



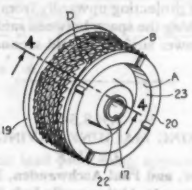
1. The method of manufacturing fire-retardant cotton felt by a continuous garnetting process which comprises adding powdered boric acid to raw cotton fiber in a metered flow at the rate of approximately 12% by weight of the raw cotton and making the introduction at a point in the material flow prior to garnetting to achieve substantial mechanical working of the boric acid into association with the natural coating of the raw cotton fibers on the carding cloth of the garnett rolls.

3,968,542

BEATER ROLL

John D. Hollingsworth, P.O. Box 516, Greenville, S.C. 29602

Filed Mar. 21, 1975, Ser. No. 561,001
Int. Cl.² D01G *15/14*
U.S. Cl. 19—97 **2 Claims**



1. A beater roll for opening fibers comprising:

a cylindrical drum constructed of molded synthetic polymeric material having a longitudinal central opening for mounting the drum for rotation;

a coil of preset metallic wire card clothing having a base portion carrying spaced carding teeth extending upwardly therefrom adjacent an edge thereof with a predetermined set in said coil of metallic card clothing such that in an unstressed state, the coil would assume an inside diameter less than an outside diameter of the drum;

said coil having successive contiguous convolutions and with such set remaining therein, upon the drum so as to aid in retaining the coil thereon by the compressive stresses produced by the set causing the clothing to bear and exert constrictive force upon the drum so as to grip the drum; and

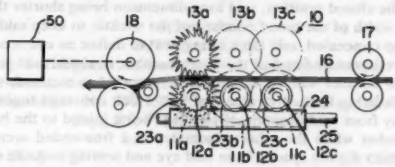
adhesive means extending between said wire card clothing and said surface of the drum as well as between said contiguous convolutions.

3,968,543

ROTARY DRAFTING APPARATUS

Masakazu Shino, Yamato-takada; Toshio Tange, Nagoya; Shigekazu Ueda, and Masashi Kobayashi, both of Kasugai, all of Japan, assignors to Chubu Seiko Kabushiki Kaisha, Kasugai and Masakazu Shino, Yamato-takada, both of, Japan

Filed July 3, 1974, Ser. No. 485,760
Claims priority, application Japan, July 6, 1973, 48-80989[U]; July 6, 1973, 48-80990[U]
Int. Cl.² D01H *5/24*
U.S. Cl. 19—293 **2 Claims**



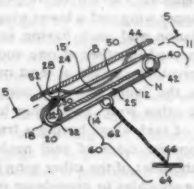
1. A rotary drafting apparatus for a spinning machine, comprising a pair of back rollers coactively rotatable for guiding therethrough, a sliver to be drafted, a pair of front rollers coactively rotatable for drafting the guided sliver, drive means for the front rollers, a sliver control means interposed between said back rollers and said front rollers and including a plurality of pairs of rotatable control rollers with respective rotatable support shafts, said shafts being arranged in spaced relation between the front and back rollers, a plurality of needles on said support shafts for combing the sliver passing through the sliver control means, and second drive means for that pair of control rollers lying closest to said front rollers for imparting thereto a predetermined substantially constant angular velocity irrespective of any variation in the tension of the sliver between the front rollers and said control rollers, said second drive means including a worm wheel secured to one end of said shaft of said closest pair of said control rollers, a prime mover, and a worm driven by said prime mover substantially at a predetermined constant velocity and meshing with said worm wheel for rotating one corresponding roller of said closest pair of said predetermined constant angular velocity.

3,968,544

TIE CLASP

James A. Sinclair, 4609 Creekbend St., Houston, Tex. 77035

Filed Mar. 19, 1975, Ser. No. 559,685
Int. Cl.² A41D *25/00*
U.S. Cl. 24—49 CF **4 Claims**



1. A tie clasp comprising a loop-forming member having a closed position defining a generally rectangular space having

a relatively long dimension and a relatively short dimension, said loop including a pair of end members and a pair of parallel front and back members extending between and secured to said end members, and a shirt link connected to said back member between the ends thereof, said loop-forming member in closed position being free of sharp projecting points, said long and short dimensions being selectively chosen to accommodate therein the back pendant of a four-in-hand necktie in free hanging position, one of said end members being a spring while the other is a latch, said front member being pivotally secured to and actuated by said spring at one of its ends, the other or free end of said front member being pointed and releasably received in said latch in the closed position of said loop-forming member, said loop forming member also having an open position in which the front member is free from said latch and extends at an angle to the back member, and may be inserted either through the front or broad pendant of said necktie or through a label or securing strip secured at its ends to the back face of said broad pendant and thereafter returned to the closed position, said long dimension being shorter than the width of the broad pendant of the necktie to keep said tie clasp concealed, said latch being bent to define an eye receiving said pointed end of the front member to shield said point from contact with cloth and other extraneous material, said latch being formed of a pair of legs which converge together away from said eye, one of said legs being joined to the back member while the other terminates in a free-ended arcuate portion slightly spaced from said eye and serving to guide said pointed end of the front into said eye.

3,968,545

SLIDE FASTENER SLIDER

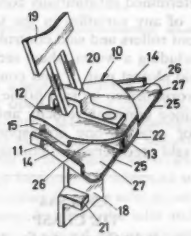
Teruaki Kawashima, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, 03, JA

Filed June 5, 1974, Ser. No. 476,427

Claims priority, application Japan, June 14, 1973, 48-70928[U]

Int. Cl.² A44B *19/26*

U.S. Cl. 24—205.15 R **1 Claim**



1. A slider for a slide fastener having rows of interengageable fastener elements carried by respective stringer tapes comprising an upper wing and a lower wing disposed in generally parallel relation and each having an inwardly directed flange and connected together at one end by a neck portion and a pull tab pivotally carried at least on one of said upper and lower wings, the flange of one of said wings being shorter than that of the other wing, said wings having unobstructed end edges, one of said wings having a transversely diverging shoulder on opposite sides of said neck portion, with the corresponding shoulder of the other wing being offset relative to said diverging shoulder to provide an open area where the upper and lower wings are not superimposed, said open area having a configuration allowing the fastener elements upon entry into said open area to tilt longitudinally and transversely to relieve creases in the stringer tapes.

3,968,546

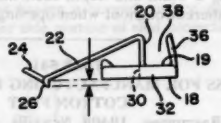
ONE-PIECE COMBINATION CLIP

Paul E. Seaborn, Los Gatos, Calif., and John R. Wyant, Marietta, Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 13, 1975, Ser. No. 540,657

Int. Cl.² B42F *1/00*

U.S. Cl. 24—67.9 **4 Claims**



1. A clip comprising:

a. a base having upper and lower surfaces and forward and rear edges,

b. a first wall projecting upwardly a substantial distance above said upper surface of said base at said forward edge thereof,

c. a second wall projecting downwardly and forwardly from an upper edge of said first wall,

d. said second wall being greater than a plurality of times the length of said first wall,

e. said second wall terminating in a gripping portion disposed in a plane beneath the plane of said lower surface of said base,

f. feet projecting forwardly from said forward edge of said base beneath said second wall and diminishing the space between said forward edge of said base and said gripping portion of said second wall,

g. attaching means for securing the clip to a supporting surface,

h. said attaching means constituting the sole means of attachment for said clip to a supporting surface and being disposed approximately in line with the plane of said first wall and being partly in said base and said feet,

i. said clip being of one-piece construction with the components thereof formed integrally with each other,

j. said clip being molded from a synthetic resinous material, and

k. protrustions projecting upwardly from outer ends of said feet diminishing the space between said outer ends of said feet and a lower surface of said second wall.

3,968,547

YARN SINGEING MACHINE HAVING A CLEANING DEVICE

Hermann Mettler, and Paul Aschwanden, both of Arth, Switzerland, assignors to Aktiengesellschaft Fr. Mettler's Sohne Maschinenfabrik, Switzerland

Filed Mar. 20, 1975, Ser. No. 560,495

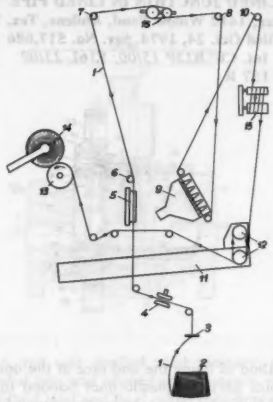
Claims priority, application Switzerland, Mar. 27, 1974, 4251/74

Int. Cl.² D02J *3/16*; D06C *9/00*

U.S. Cl. 28—63 **3 Claims**

1. A yarn singeing machine, comprising a singeing burner, a yarn cleaning device, yarn winding means for winding treated yarn onto a spool, a yarn supply, a yarn brake for braking the movement of said yarn, a yarn delivery mechanism having a plurality of advance rollers around which the yarn is directed, deflecting means deflecting the yarn into a lengthened run between said burner and said cleaning device and between said cleaning device and said yarn winding means, said brake and said delivery mechanism comprising

yarn tension reducing means, and means for directing said yarn from said yarn supply through said yarn brake, said



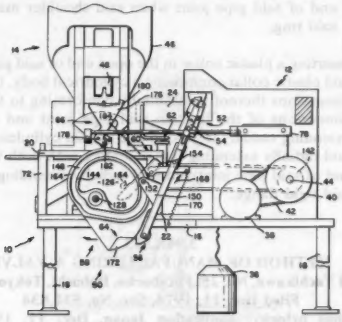
burner, said cleaner, said deflecting means, said delivery mechanism and to said yarn winding means.

3,968,548

LEAD TRANSFER MECHANISM

Donald George Clark, Instow, and Ivan Godfrey Oliver Brown, Barnstaple, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 16, 1974, Ser. No. 533,390
Int. Cl.² B21F *15/00*
U.S. Cl. 29—33 M **17 Claims**



1. In an automatic lead processing apparatus including a frame;

a mechanism mounted on said frame and operable to feed a predetermined length of lead from a lead supply, and to cut and strip the lead after feeding; and

an applicator mounted on said frame at a location spaced away from said mechanism and operable to apply a termination to the cut and stripped end of the lead;

the combination therewith of a lead transfer mechanism including:

lead engaging means shiftable between a closed engaging position and an open position where it is capable of either receiving or discharging a lead;

conveyor arm means pivotally mounted on said frame, one end of said conveyor arm means carrying said lead engaging means;

rotary cam means rotatably mounted on said frame and interconnected with said conveyor arm means and operable upon rotation of said cam means to swing said one end of the conveyor arm means between a first position adjacent said mechanism and a second position adjacent said applicator; and shifting means for normally shifting the lead engaging means between closed and open positions in timed sequence to the movement of the conveyor arm means, causing said lead engaging means to receive and engage a lead when said one end of said conveyor arm means is in the first position, to hold the lead as said one end of the conveyor arm means is moved from the first position to the second position, and to open the lead engaging means when said one end of the conveyor arm means is in the second position;

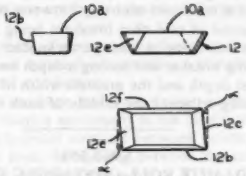
said shifting means including first shiftable means for normally shifting the lead engaging means from its open position to its closed position when said one end of the conveyor arm means is disposed in its first position.

3,968,549

CUTTING TOOL

Edwin A. Carpenter, Milwaukee, Wis., assignor to Allied Tool Products, Inc., Milwaukee, Wis.

Division of Ser. No. 237,157, March 22, 1972. This application Sept. 23, 1974, Ser. No. 508,425
Int. Cl.² B26D *1/00*
U.S. Cl. 29—95 R **3 Claims**



1. A cutting insert adapted to be reversibly mounted in tool holder means, said cutting insert having a cutting tip formed at each end for making a cut in a work piece, a component of the force on said insert resulting from the engagement between said insert and a work piece being directed in a first direction,

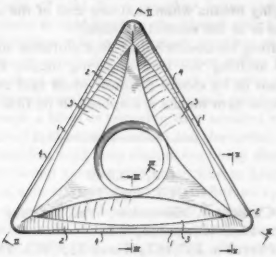
said insert having a first face on the side thereof presented to the work piece when said insert is in an operative position and a second face on the opposite side,

said insert having a third face intersecting said first and second faces at substantially the same angle, said third face being generally parallel to said first direction and adapted to be engaged by a conforming surface formed in a tool holder, said cutting tips being formed by fourth and fifth faces formed respectively on the opposite ends of said insert, said fourth face intersecting said first and third faces and said fifth face intersecting said second and third faces, said faces intersecting at substantially the same angle for each of said cutting tips, whereby said fifth face is adapted to engage an angularly arranged surface on a holder when said insert is positioned with the cutting tip formed by said fourth surface is presented to a work piece and said fourth surface is adapted to engage the same angularly arranged surface when said insert is reoriented with the cutting tip formed by said fifth face is presented to a work piece.

3,968,550
HARD METAL CUTTING BIT

Hermann Gehri, Prangins, Switzerland, assignor to Stellram SA, Nyon, Switzerland

Filed Dec. 16, 1975, Ser. No. 641,354
Claims priority, application Switzerland, Jan. 14, 1975, 391/75
Int. Cl.² B26D 1/00
U.S. Cl. 29—95 R 4 Claims

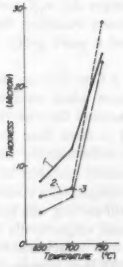


1. A polygonal hard metal cutting bit comprising on at least one of its faces a fillet extending about the entire periphery of the bit, the fillet being concave between the corners of the bit, the bit also having two chip breakers on each side of the bit, a first of said chip breakers being next to said fillet and having a width and depth that are maximum adjacent the corners of the bit and a minimum mid-way between the corners of the bit, the second of said chip breakers being concave and discontinuous and being at least partly spaced from the fillet by said first chip breaker and having a depth and width that vary, the greatest depth and the greatest width of said second chip breaker being adjacent the middle of each side of the bit.

3,968,551
ADAMITE ROLL CONTAINING COBALT

Kakunosuke Miyashita, Tokyo, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed June 9, 1975, Ser. No. 584,836
Claims priority, application Japan, June 12, 1974, 49-66103
Int. Cl.² B21B 31/08
U.S. Cl. 29—132 4 Claims

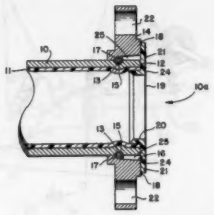


1. An Steel based Adamite roll containing, in weight percent, from 1.0 to 2.2 percent C, from 0.5 to 0.8 percent Si, from 0.5 to 0.8 percent Mn, from 0.5 to 1.0 percent Ni, from 1.0 to 2.0 percent Cr, from 0.1 to 1.0 percent Mo, from 0.5 to 2.0 percent Co, the balance being essentially Fe, and a reasonable amount of impurities.

3,968,552
METHOD AND APPARATUS FOR FORMING PLASTIC LINED JUNCTION IN LINED PIPE

John J. Hunter, 1410 Willow Pond, Abilene, Tex. 79103

Filed Oct. 24, 1974, Ser. No. 517,686
Int. Cl.² B23P 15/00; F16L 23/02
U.S. Cl. 29—157 R 5 Claims



1. The method of lining the end face at the open end of a lined pipe joint having a plastic liner bonded to the entire interior of said pipe joint comprising the steps of

a. rolling an annular groove adapted to mate with a compression ring of circular cross-section in the outer surface of said pipe joint at a predetermined distance from the open end of said pipe joint,

b. placing a ring of circular cross-section within said annular groove,

c. placing a rigid flange on the outer surface of said pipe joint, said flange having a central opening substantially conforming to the outer dimensions of said pipe joint and having

i. an annular shoulder in said central opening mating with said ring and

ii. a radially extending face lying in the plane of the open end of said pipe joint when said shoulder mates with said ring,

and

d. inserting a plastic collar in the open end of said pipe joint, said plastic collar comprising a cylindrical body, the outer dimensions thereof substantially conforming to the inner dimensions of the liner in said pipe joint and a flange extending radially from one end of said cylindrical body, said radially extending flange mating with both the open end of said pipe joint and said radially extending face on said rigid flange.

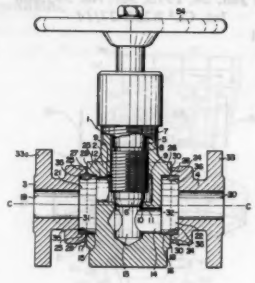
3,968,553
METHOD OF MANUFACTURING A VALVE

Sakuji Tachikawa, No. 25, Futabacho, Itabashi, Tokyo, Japan

Filed Dec. 11, 1974, Ser. No. 531,834
Claims priority, application Japan, Dec. 17, 1973, 48-141606; Nov. 22, 1974, 49-134891
Int. Cl.² B23P 15/00; B23K 19/02
U.S. Cl. 29—157.1 R 3 Claims

1. A method of making a valve comprising the steps of forming a valve body with a body inlet passage opening up on one side of said valve body into a larger diameter body inlet stay passage with a body outlet passage opening up on the other side of said valve body into a larger diameter body outlet stay passage, forming a fluid inlet member with an inlet passage opening up one side thereof into a larger diameter inlet stay passage, forming a fluid outlet member with an outlet passage opening up on one side thereof into a larger diameter outlet stay passage, aligning said fluid inlet member with said body inlet passage such that said body inlet stay passage is generally axially with said inlet member stay passage, aligning said fluid outlet member with said body outlet passage such that said body outlet stay passage is generally axially aligned with said outlet member stay passage, rotating said fluid inlet and fluid outlet members at high speed relative to said valve

body while applying axial pressure urging said fluid inlet and fluid outlet members towards said valve body, producing molten material at the interface between said valve body and said fluid inlet and fluid outlet members resulting from friction



therebetween and said applied axial pressure, passing said molten material into said aligned stay passages, and pressure welding said fluid inlet and fluid outlet members to said valve body utilizing the high frictional heat and pressure to effect the weld.

3,968,554

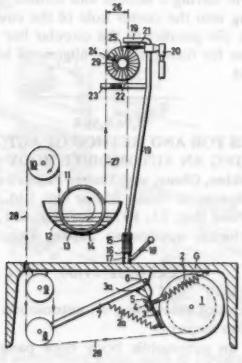
HEAT EXCHANGER

Franciscus Roffelsen, Helmond, Netherlands, assignor to Naamloze Venootschap Spiro Research N.V., Helmond, Netherlands

Division of Ser. No. 56,366, July 20, 1970, Pat. No. 3,703,253. This application Sept. 5, 1972, Ser. No. 286,455

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 AH **1 Claim**



1. In a method of manufacturing a heat exchanger by helically wrapping, about the outer surface of a carrier tube and with a prescribed pitch, at least one wire helix having a plurality of successive turns of relatively large radial extent, and rigidly securing the inner surfaces of the successive turns of the helix to the outer surface of the tube, an improved technique for reinforcing the resulting heat exchanger, which comprises the steps of:

rotating the tube on its axis and simultaneously advancing the tube by an amount corresponding to the pitch of the helix;

winding a separate support wire around the radially outer edge extremity of each of the turns of the spirally advancing helix under a constant selectable tension; and

intimately securing the wound support wire to each of the associated adjacent outer edges of the turns of the helix.

3,968,555

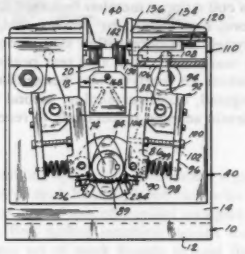
ELECTRICALLY OPERATED PROGRAMMABLE INSERTION TOOL WITH CONDUCTOR GUIDE AND MOVABLE STRAIN RELIEF INSERTION MECHANISMS

Harley Raymond Holt, Forest Park, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 500,633, Aug. 26, 1974, abandoned. This application Feb. 11, 1975, Ser. No. 548,903

Int. Cl.² H01R *43/04*

U.S. Cl. 29—203 MW **60 Claims**



1. A conductor terminating mechanism for terminating a plurality of insulated conductors in respective terminating portions of respective spaced apart electrical contacts which are supported in alignment by an electrical device, comprising:

device support means for supporting the electrical device;

conductor support means for supporting a plurality of free-ended insulated conductors;

a carriage, said carriage and said device support means mounted for relative movement in the direction of alignment of the electrical contacts between points spaced a distance of at least the spacing between the terminating portions of the electrical contacts;

an insertion tool mounted on said carriage for movement toward the electrical device and including at least one insertion blade for engaging and pressing a conductor into the terminating portion of the electrical contact;

a conductor guide means mounted on said carriage for accurately positioning a conductor in an interference relationship with the insertion tool between the tool and a terminating portion of an electrical contact as the conductor is moved, under tension, toward that termination portion;

an insertion programmer operable to effect movement of said carriage to the spaced points; and

insertion control means including switch means operated upon accurate positioning of the conductor to effect movement of the insertion tool.

3,968,556

WEDGE FEEDING MECHANISM FOR SHORT STROKE DYNAMOELECTRIC MACHINE COIL AND WEDGE INSERTING APPARATUS

Charles W. Morr, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

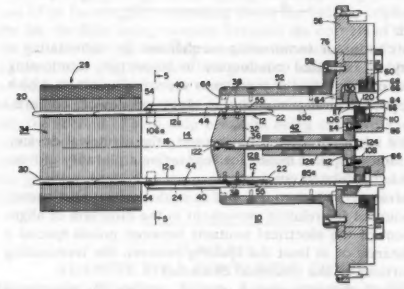
Filed Nov. 7, 1975, Ser. No. 629,722

Int. Cl.³ H02K *15/10*

U.S. Cl. 29—205 D **3 Claims**

1. In apparatus for inserting prewound coils and slot wedges into the slots of an internally slotted dynamoelectric machine stator core member, said apparatus including a plurality of elongated, axially extending parallel blade elements defining

a bore having an axis and having outer surfaces, said blade elements being spaced about said bore and defining radially and axially extending spaces therebetween, said blade elements having distal ends and rear portions, the outer surfaces of said distal ends being adapted to engage the inner ends of the teeth of a stator core member which define said slots with the spaces between said blade elements being in axial alignment with and communicating with respective slots, a plurality of elongated, axially extending, parallel slot wedge guide elements respectively in axial and radial alignment with said blade elements and defining first wedge guide slots therebetween respectively in axial and radial alignment with said blade element spaces and in axial alignment with said stator core member slots, said guide elements respectively abutting the outer surfaces of the rear portions of said blade elements and having forward ends which are spaced rear-wardly from said distal ends of said blade elements and also having rear portions, a coil stripper member mounted for axial movement in said bore, first means for moving said stripper member axially through said bore within said blade elements, means extending rear-wardly from said rear portions of said wedge guide members for receiving slot wedges and having a plurality of elongated, axially extending, second wedge guide slots formed therein adapted respectively to receive slot wedges at



a first location, said second wedge guide slots being respectively in axial alignment with said first wedge guide slots and communicating therewith, first means for pushing said slot wedges forwardly from said first location through said second wedge guide slots to a second location in said first wedge guide slots spaced rearwardly from said forward ends of said wedge guide elements, second means spaced axially forwardly from said first pushing means for pushing said slot wedges forwardly from said second location through said first wedge guide slots and to a third location, and reciprocating means for moving said first and second pushing means forward and for returning the same to push a first group of slot wedges from said second location to said third location as a second group of slot wedges are pushed from said first location to said second location on the forward stroke of said reciprocating means; the improvement wherein said second pushing means comprises a rigid pushing element axially movable between rear and forward positions and having a plurality of fingers extending radially therefrom, one each of said fingers extending into said wedge guide slots, means on each of said fingers for engaging said slot wedges when said pushing element is moved forwardly to move said slot wedges forward, and camming means on each of said fingers for preventing said fingers from engaging and moving the slot wedges at said second location rearwardly as said pushing element is returned to its rear position.

3,968,557

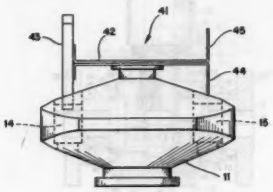
ALIGNMENT OF CENTRIFUGE CELLS AND COUNTERBALANCES

Charles H. Chervenka, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 24, 1975, Ser. No. 543,668

Int. Cl.² B25B *27/14*

U.S. Cl. 29—271 **2 Claims**



1. A tool for angular alignment of cells and counterweights in centrifuge rotors having diametrically oppositely located cylindrical chambers for reception of such cells and counterweights, the rotor and chambers having parallel axes, each cell having a window holder with a straight sided aperture, each counterweight having a center hole and an alignment hole spaced radially therefrom, said tool comprising:

a diametrically extending arm having first and second ends,

a tool arm secured to the first end of the diametrically extending arm, perpendicular thereto, extending in opposite directions from the diametrically extending arm,

a cell guide at the second end of the diametrically extending arm at right angles thereto,

a counterweight guide at the second end of the diametrically extending arm at right angles thereto,

the tool arm having an end formed with an oblong cross section for fitting into the cell window holder, said end of said tool arm extending in the same direction from the diametrically extending arm as the cell guide,

the tool arm having a second end formed as a circular bar for fitting into the center hole of the counterweight and having a pin parallel to the circular bar spaced radially therefrom for fitting into the alignment hole of the counterweight.

3,968,558

APPARATUS FOR AND METHOD OF AUTOMATICALLY ASSEMBLING AN AUTOMOBILE BODY STRUCTURE

Yoshitada Sekine, Ohme, and Tsuneo Fujikawa, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Dec. 11, 1974, Ser. No. 531,813

Claims priority, application Japan, Dec. 14, 1973, 48-138800

Int. Cl.² B23P *21/00, 19/04*

U.S. Cl. 29—429 **13 Claims**

1. A method of assembling an automobile body structure, comprising the steps of:

providing an automobile body floor panel and a pair of automobile body side panels;

conveying the floor panel to a predetermined substantially horizontal working position;

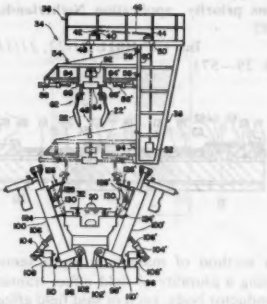
vertically suspending the side panels in a closely horizontally spaced condition;

downwardly conveying the side panels and simultaneously gradually increasing the horizontal spacing between the side panels to position the side panels at first temporary positions above said working position and horizontally spaced parallel to each other and extending substantially parallel to the fore-and-aft direction of the floor panel;

positioning the respective lower ends of the side panels laterally of said floor panel at predetermined lateral positions respectively on opposite sides of the floor panel;

positioning the side panels longitudinally of the floor panel at predetermined fore-and-aft positions relative to the floor panel;

tilting the side panels away from each other about said respective lower ends of the side panels to second temporary positions;



moving the side panels laterally inwardly of the floor panel to position the side panels for welding the same to the floor panel; and

welding the side panels to the floor panel to form a unitary automobile body structure.

3,968,559

METHOD AND ARRANGEMENT FOR ASSEMBLY OF COMPONENT PARTS, PREFERABLY FOR MOTOR VEHICLES

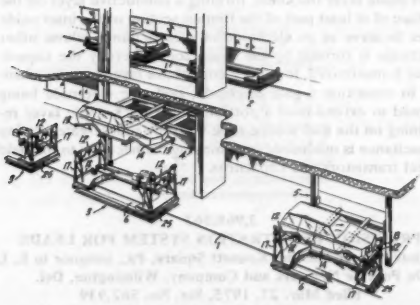
Sven Torgny Karlsson, Ockero, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed May 15, 1973, Ser. No. 360,586

Claims priority, application Sweden, May 19, 1972, 6607/72

Int. Cl.[2] B23P *19/04, 21/00;* **B60L** *27/00, 27/04*

U.S. Cl. 29—430 **15 Claims**



1. A method of assembling units, such as bodies, chassis and motors of automobiles, in which each of a plurality of incomplete units is moved forward along a main assembly line to successive assembly stations for the addition of components to the unit until the unit is complete, the method comprising placing and transporting each incomplete unit on a different one of a plurality of individually motor-driven transport cars, the transporting being along a path through the successive assembly stations, adding components to each unit while it remains placed on its transport car at at least some of such stations, and individually controlling the movement of the transport cars between the stations by signals from at least one control wire connected with a control center and running in the direction of the main assembly line whereby the speed of assembling the components to each unit at the assembly stations is independent of the speed of assembling the components to other units.

3,968,560

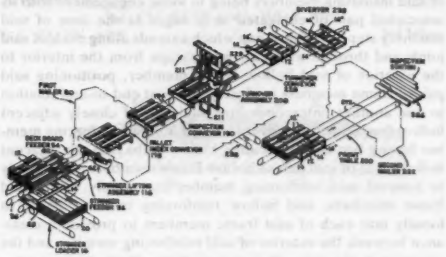
PALLET ASSEMBLING SYSTEM

Garye R. Vial, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 16, 1974, Ser. No. 533,436

Int. Cl.[2] B27M *1/08;* **B27B** *31/00;* **B27C** *9/00*

U.S. Cl. 29—430 **18 Claims**



1. A pallet assembling system for assembling a pallet comprised of a plurality of deck boards placed crosswise to and on both sides of a plurality of spaced parallel stringers, said system comprising a first nailing machine, means for simultaneously feeding one set of deck boards to said first nailing machine, means for individually and sequentially feeding said stringers to said first nailing machine and for aligning said stringers within said first nailing machine in a position underlying said one set of deck boards for receipt of fasteners from said nailing machine, means for indexing said one set of deck boards after the delivery of each successive stringer to the nailing machine and the nailing of said deck boards to said stringer, a turnover device positioned downstream from said first nailing machine for reversing the orientation of the half-formed pallet after the first set of deck boards have been nailed by rotating it through 180° to place the unnailed side of the pallet face up, a second nailing machine, means for feeding said turned pallet to said second nailing machine, means for feeding a second set of deck boards to said second nailing machine in a position overlying said turned pallet, and diverting means located between said first nailing machine and said pallet feeding means of the second nailing machine for providing an offset in the path of the pallet through the system so that the deck boards for the second nailing machine can be directly loaded into said pallet feeding means at the upstream end thereof by being moved in a direction parallel to their longitudinal axes.

3,968,561

METHOD OF FABRICATING HOLLOW, FOAM-FILLED, METAL STRUCTURAL MEMBERS

Thomas Francis Oakes, Aldwick, Selkirk Gardens, Cheltenham, Gloucestershire, and Martin Bridgewater, 2 Highland Road, Charlton, Kings, Cheltenham, Gloucestershire, both of England

Division of Ser. No. 349,894, April 10, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,837

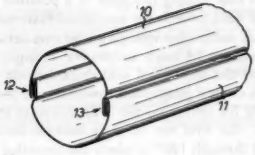
Claims priority, application United Kingdom, Apr. 12, 1972, 16781/72

Int. Cl.[2] B23P *3/00*

U.S. Cl. 29—460 **4 Claims**

1. The method of constructing a structural member for use in an architectural or building panel, comprising the steps of fabricating a pair of hollow frame members, each of said frame members being fabricated by shaping a pair of elongted thin sheet metal strips to desired cross-sectional profiles, assembling said profiled strips into a comparatively weak, hollow frame member by positioning the shaped strips in

general alignment with one another with the profiled portions of said strips being in opposing spaced relation to one another and with each elongated edge of each strip being disposed adjacent to but spaced from an elongated edge of the other strip, said assembly step for each frame member further comprising bridging the space between the edges in each pair of adjacent edges of said two strips by means respectively of two elongated thermal insulating members which extend respectively along the two pairs of adjacent spaced edges to form two spaced longitudinal joints in said hollow frame member, each of said insulating members being in loose engagement with its associated pair of elongated strip edges at the time of said assembly step to define a gap which extends along each of said joints and through which air may escape from the interior to the exterior of said hollow frame member, positioning said pair of frame members in closely adjacent end-to-end relation to one another, interconnecting said pair of closely adjacent hollow frame members by inserting a hollow reinforcing member having two communicating hollow limbs into the adjacent hollow ends of said pair of hollow frame members respectively to conceal said reinforcing member completely within said frame members, said hollow reinforcing member being fit loosely into each of said frame members to provide a clearance between the exterior of said reinforcing member and the



interior facing surfaces of said frame members, and thereafter strengthening said hollow frame members with a rigidifying plastic material by introducing plastic foam material in fluid form into the spaces between said pairs of profiled strips to completely fill each of said hollow frame members and to extend continuously between said two frame members via the communicating hollow limbs of said reinforcing member while displacing air from the interior of said reinforcing member and the interiors of said hollow frame members via said gaps in said joints, said plastic foam introducing step being continued to an extent sufficient to cause said plastic foam material to penetrate into each of said longitudinal joints and into said clearance to close each of said gaps and to form an adhesive bond connecting each of said thermal insulating elements to its associated pair of elongated strip edges thereby to fixedly connect the pair of metal strips in each frame member to one another along said joints and to fixedly connect said pair of frame members to one another at said reinforcing member, the portions of said introduced plastic foam material which penetrate into each of said joints and into said clearance changing in consistency at the time of penetration from a cellular foam to a solid homogeneous material to cause said plastic material to exhibit a higher density in said joints and clearance than in the main spaces within said hollow frame members.

3,968,562

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

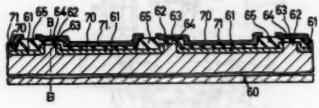
Joseph Gijsbertus Van Lierop, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 304,391, Nov. 7, 1972, abandoned. This application Feb. 11, 1975, Ser. No. 548,999

Claims priority, application Netherlands, Nov. 25, 1971, 7116182

Int. Cl.[2] H01L *21/22, 21/316*

U.S. Cl. 29—571 **7 Claims**



1. A method of manufacturing a semiconductor device containing a plurality of field effect transistors comprising a semiconductor body, each of said field effect transistors comprising two spaced surface zones of one conductivity type which extend in a region of the opposite conductivity type adjoining a surface of the semiconductor body, said surface zones constituting source and drain zones of the field effect transistor having at least one insulated gate electrode and defining in the opposite type region under the gate electrode a channel region wherein carriers can be caused to flow from source to drain, comprising providing an oxidation masking pattern which includes a material other than a semiconductor oxide over at least the channel region and introducing impurities into the semiconductor body to form the said surface source and drain zones, selectively oxidizing the semiconductor surface in apertures in the oxidation masking the pattern to form a thick patterned oxide layer inset in the semiconductor body at least over a part of its thickness and covering at least part of each of the said source and drain zones, thereafter forming a thinner section of the inset oxide layer present above at least part of said drain zone by removing part of the inset oxide layer thickness, forming a conductive layer on the surface of at least part of the thinner section of the inset oxide layer to serve as an electrode of a capacitance whose other electrode is formed by the drain zone whereby the capacitance is maximized, forming a conductive layer over the channel to constitute a gate electrode, said gate electrode being formed to extend over a portion of the thick oxide layer remaining on the said source zone whereby source-gate overlap capacitance is minimized, and making connections to the field effect transistors and capacitors.

3,968,563

PRECISION REGISTRATION SYSTEM FOR LEADS

Arthur Houser Hamlin, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

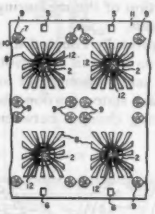
Filed Mar. 27, 1975, Ser. No. 562,939

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—591 **2 Claims**

1. A process for preparing sets of finger-like leads and mounting them on semiconductive devices comprising forming first holes in a carrier strip which holes are adapted to surround a semiconductive device, forming second holes in said carrier strip adjacent said first holes and spaced in a predetermined registration with said first holes, applying a metallic layer to said carrier strip, which metallic layer covers said first and second holes, which metallic layer is of a metal suitable for forming sets of finger-like leads, and which metallic layer is intimately adhered to said carrier at least in the areas immediately surrounding said holes, applying a resist to said metallic layer which partially overlies said first holes in a pattern to form said sets of finger-like leads over said first holes and which overlies said second holes, except for an

aperture smaller than and surrounded by each of said second holes to form indexing holes over said second holes, etching away the metallic layer not covered by the resist to simultaneously form sets of finger-like metallic leads, and apertured



metallic indexing members protruding over said second holes, and bonding semiconductive devices to the sets of finger-like leads using the etched indexing holes to achieve the registration between the lead frame and the semiconductive device.

3,968,564

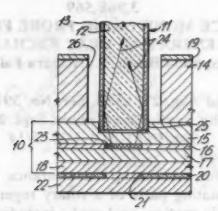
ALIGNMENT OF OPTICAL FIBERS TO LIGHT EMITTING DIODES

Anthony John Springthorpe, Richmond, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Apr. 30, 1975, Ser. No. 573,266

Int. Cl.² B01J 17/00

U.S. Cl. 29—580 **4 Claims**



1. A method of aligning optical fibres to light emitting diodes, comprising;

forming a mesa on a surface of a semiconductor substrate;

said mesa of a diameter equal to the diameter of an optical fibre;

sequentially forming a plurality of layers on said one surface, said layers including first and second confining layers and an active layer between said confining layers;

forming a contact on an outer layer of said plurality of layers, said contact aligned with said mesa;

forming an electrical contact layer on the surface of the substrate remote from said one surface;

forming a clearance hole in said substrate, said clearance hole surrounding and being larger than said mesa, and removing said mesa to form a locating recess in the first of said plurality of layers for said fibre.

3,968,565

METHOD OF MANUFACTURING A DEVICE COMPRISING A SEMICONDUCTOR BODY

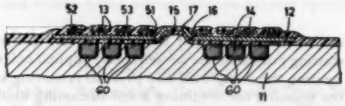
Theodorus Cornelius Johannes Maria Bertens; Hendrikus Josephus Antonius Van Dijk, and Jan T. Gerkema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 392,791, Aug. 29, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,784

Claims priority, application Netherlands, Sept. 1, 1972, 7211910

Int. Cl.² G11B 5/42; H01F 7/06

U.S. Cl. 29—603 **5 Claims**



1. A method of manufacturing a film-deposited magnetic head comprising the steps of:

a. providing a semiconductor body having a flat major surface, said body having adjacent its flat major surface a semiconductor layer portion of high electrical resistivity,

b. introducing into the semiconductor body from its major surface to a depth less than that of the high resistance layer portion doping impurities to a concentration which when incorporated into the semiconductor body substantially reduces its resistivity, the distribution of said introduced impurities and its resultant profile substantially exactly corresponding to the negative of a non-planar profile which it is desired to shape into the body surface, said desired profile including body surface portions at plural levels,

c. thereafter subjecting the thus-doped body to a selective electrolytic etching process which operates to remove the doped surface portions of reduced resistivity but not the high resistivity portions until said doped surface portions are substantially entirely removed leaving intact deeper high resistivity portions forming the desired non-planar profile,

d. thereafter depositing on the non-planar profiled surface a continuous film of conductive material which extends over the different levels of the non-planar profile, and

e. thereafter completing by deposition electrical windings and a gapped magnetic circuit of the magnetic head utilizing the film of conductive material to form conductive elements recessed in some of the deeper areas of the non-planar profile.

3,968,566

METHOD OF FORMING A DEFLECTION YOKE SYSTEM

Rudolf Schubert, Dornstadt, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 444,101, Feb. 20, 1974, abandoned, which is a continuation of Ser. No. 229,343, Feb. 25, 1972, abandoned. This application Dec. 19, 1974, Ser. No. 534,219

Claims priority, application Germany, Feb. 27, 1971, 2109439

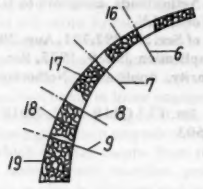
Int. Cl.² H01F 41/06

U.S. Cl. 29—605 **3 Claims**

1. A method of winding a saddle shaped deflection coil comprising:

a. providing a mandrel having a recess, whose shape corresponds to the final shape of the coil, for receiving continuously applied coil turns of wire;

b. continuously applying coil turns of wire into said recess to wind the saddle shaped deflection coil;
c. during said step (b), inserting projections at predetermined positions into the recess after applying a predetermined number of coil turns to provide predetermined starting points for the subsequently applied coil turns; and
d. heating the completed coil prior to removing same from the mandrel for obtaining a self-sustaining unit.



3,968,567

ENDODONTIC COMPOSITION AND METHOD

Alan J. Nevins, 200 Carmen Ave., Apt. 7C, East Meadow, N.Y. 11554

Filed Apr. 21, 1975, Ser. No. 569,675
Int. Cl.[2] A61K 5/01
U.S. Cl. 32—15 20 Claims

1. A method for causing formation of a physiologic seal across the opening of a rigid, cavity-containing tubular member adjacent capsular connective tissue within a mammalian body comprising
a. filling the tube with a gelable composition comprising collagen, a calcium salt, and a phosphate salt,
b. allowing the composition to gel, and
c. permitting the ingrowth of connective tissue into the cavity.

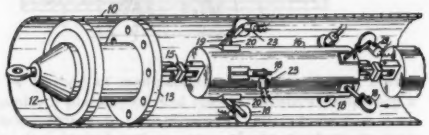
3,968,568

ENCODER ERROR CORRECTION MEANS FOR USE WITH A DISTANCE MEASURING WHEEL

Bobby R. Jackson, Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 10, 1974, Ser. No. 487,184
Int. Cl.[2] G01B 3/12, 7/04; G01C 22/00
U.S. Cl. 33—141 G 10 Claims

1. In apparatus for measuring the relative translation between a base member and a surface wherein indication of translation is produced by a rotatable wheel and a measuring device having a rotor portion and a stator portion which are relatively movable about an axis, and wherein said wheel is supported against said surface by a pivot arm which is pivotally coupled at a first position on the base member and wherein the arm is inclined with respect to the surface and subject to a change in its angle of inclination when the lateral spacing between said surface and base member changes, thereby producing a rotation of said wheel and an erroneous indication of relative translation, the improvement for minimizing such an erroneous indication comprising
means for mounting said measuring device on said apparatus and for coupling the rotor portion thereof to said wheel for rotating the rotor as a function of the rotation of the wheel,
the stator portion of the measuring device being rotatable about said axis,
a crank arm pivotally coupled to said stator at a location removed from said axis and pivotally coupled to a second position on said base member to provide a crank action to rotate said stator portion about said axis when the lateral spacing changes between said surface and base member,



said pivot arm and said crank arm forming opposite sides of a quadrangular shaped four bar linkage,
the portion of said stator between said axis and the pivotal coupling to said crank arm forming a third side of said linkage and the portion of said base member between said first and second positions comprising the forth side opposite to said third side,
the lengths of said pivot arm and said crank arm and the coupling locations of said crank arm to said stator portion and to said base member being proportioned and arranged to make the rotation of the stator portion substantially equal in magnitude to the rotation of said wheel throughout a given range of angles of inclination of said pivot arm caused by changes in the spacing between said base member and said surface.

3,968,569

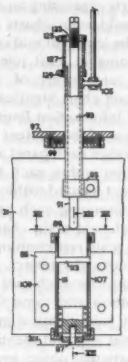
CLEARANCE MONITORING PROBE FOR ROTARY REGENERATIVE HEAT EXCHANGER

Gordon J. Faris, 8004 Booth St., Niagara Falls, Ontario, Canada

Filed Aug. 27, 1973, Ser. No. 391,094
Claims priority, application Canada, Sept. 21, 1972, 152223
Int. Cl.[2] G01B 3/22, 5/14
U.S. Cl. 33—169 R 3 Claims

1. A probe for monitoring the clearance between the stationary and rotating parts of a rotary regenerative heat exchanger while in motion, said probe including:
a housing suitable for mounting on a stationary part of the heat exchanger, the housing having a bore,
a plunger slidable in said bore without rotation,
a roller mounted on said plunger so that its curved surface projects beyond the end of said plunger,
spring means acting on said plunger in such direction as to retract the roller relative to the housing, and
adjustment means for resiliently moving the plunger a measurable distance against the force of said spring means to bring said roller into contact with a movable part of said heat exchanger while permitting slight movement of said roller when contacted by said movable part,
and, wherein said adjustment means includes a tube mountable on said stationary part co-axial with said plunger and at the end of said plunger remote from the roller, a rod slidable in said tube and having a threaded portion, and screw threaded means received on said threaded portion and held non-rotatably relative to said tube by resilient means permitting slight movement of said screw threaded means with said rod in a direction away from said

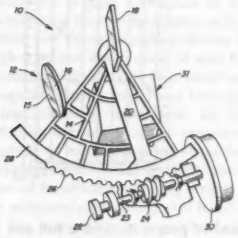
plunger, whereby said plunger may be moved towards the rotating part of the heat exchanger by rotation of said rod in said screw threaded means, said resilient means allowing slight movement of said roller when contacted by said rotating part, said slight movement being suitable for detection by sensing means.



3,968,570
ELECTRONIC SEXTANT

Fred A. Leuchter, Jr., 174 Belmont St., Malden, Mass. 02148

Continuation-in-part of Ser. No. 377,753, July 9, 1973, abandoned. This application Aug. 12, 1974, Ser. No. 496,392
Int. Cl.[2] G01C *1/08*
U.S. Cl. 33—267 **6 Claims**



1. An improved double-reflecting sextant for accurately measuring an angle and for automatically providing angular measurement and time electrical output signals which are suitable for further electrical processing and automatic data reduction and comprising:

a. a sextant including means for measuring an angle and including a horizon mirror-glass and an index mirror, whereby the sextant may be collimated by aligning an image of the horizon on the index mirror with a horizon sighting through the horizon mirror-glass, and then the altitude of a celestial body above the horizon may be measured by adjusting the angular position of the index mirror until an image of the celestial body on the index mirror is aligned with a horizon sighting through the horizon mirror-glass, and a digital encoder means for providing a digital electrical signal indicative of the magnitude of said measured angle;

b. clock means for providing an accurate indication of the time at which the measurement is made and for producing an electrical output signal indicative of that time; and

c. electronic means, including means actuated by the operator for completing an electrical circuit for a given period of time, for automatically providing synchronized output electrical signals from said measuring means and said clock means which are suitable for further electrical processing and automatic data reduction, said electronic means including first electronic means coupled to said encoder means for automatically providing an average of said angle measurement over the given period of time, and second electronic means coupled to said clock means for automatically providing an averaged time during which the measurement is made over the given period of time, whereby a single operator may take measurements with the sextant thereby eliminating the requirement for a second operator, and further eliminating synchronization and transcription errors between several operators.

3,968,571
DRYING PROCESS

Christian Oschatz, Rummingen, Germany, and Franz Somm, Riehen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

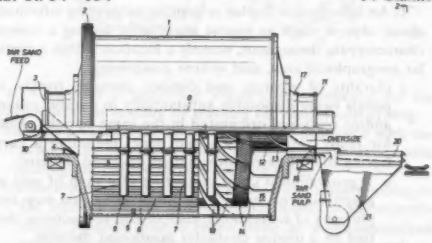
Filed Oct. 29, 1974, Ser. No. 518,576
Claims priority, application Switzerland, Jan. 25, 1974, 1043/74; Nov. 2, 1973, 15453/73
Int. Cl.[2] F26B *5/14, 25/20*
U.S. Cl. 34—14 **15 Claims**

1. In a process for the removal of a liquid from an absorbent substrate comprising passing the substrate through the nip of a pair of rollers, of which at least one roller of said pair is provided with a sponge material, the improvement wherein: (1) the average diameter of the capillary pores of said sponge material is less than 1 mm and the diameter of at least 50% of the capillary pores being in the range of 0.1 to 0.001 mm; and (2) the pressure at the nip of said rollers is less than 1 kg. per cm. roller length.

3,968,572
CONDITIONING DRUM FOR USE IN HOT WATER SEPARATION OF BITUMEN FROM MINED TAR SANDS

Frederick C. Stuchberry, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 3, 1975, Ser. No. 564,959
Int. Cl.[2] F26B *11/02*
U.S. Cl. 34—134 **14 Claims**



1. A tar sands conditioning drum for mulling of mined tar sand lumps into pulp through the addition of hot water, steam

and caustic which comprises; a horizontally disposed cylindrical drum of a length to diameter ratio of between 0.5:1 and 1.25:1, rotatable around its longitudinal axis and having

a. an axial opening at one end for introduction of mined tar sand, water and caustic;

b. a second axial opening at the other end for rejection of oversize and discharge of mulled tar sands pulp, said second axial opening being divided by a coaxial grate member, extending along the longitudinal axis of the drum, into an outer annular opening for discharge of tar sands pulp and an inner axial opening for rejection of oversize, said grate size being sufficient to allow ready passage of tar sands pulp into a discharge passageway defined by said outer annular opening while retaining the oversize; and

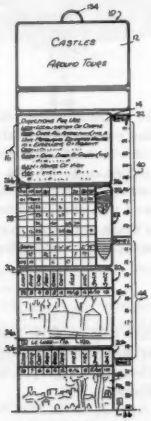
c. an externally supported stationary steam header extending into and substantially over the length of the drum interior along the longitudinal axis of the drum having affixed thereto, in fluid communication, a plurality of steam conduits which project downwardly from the steam header to a point above the lower interior surface of the drum, said steam conduits being positioned at spaced intervals along the length of the steam header and perforated for injection of steam into said cylindrical drum.

3,968,573

METHOD AND MEANS FOR INFORMATION PRESENTATION

Jean-Paul Poliniére, Biarritz, France, assignor to Allen Grossman, New York, N.Y., a part interest

Filed Oct. 24, 1974, Ser. No. 517,748
Int. Cl.[2] G09B 29/00
U.S. Cl. 35—7 R **3 Claims**



1. An information display system for presenting information about objects, such as tourist attractions, having a common characteristic throughout, namely a location within a particular geographical area, said system comprising:

a plurality of separate and distinct, portable panels, said panels being disposable substantially in parallel columns and/or rows and orientated in the same upright position for ready viewing, each said panel including a carrier having the following information disposed thereon;

a. a geographical chart consisting of a map of said geographical area, and means for dividing said map into a plurality of subsections, each of said subsections identified by a unique character positioned thereon,

b. a marginal scale, said scale consisting of a predetermined order of said unique characters disposed upon said carrier at intervals along the edge of said carrier, said marginal scale identically disposed on each said carrier,

c. a plurality of separate and physically independent, self-sufficient and self-contained, main charts, each of said main charts expressing an essential element of said information, said main charts disposed, one after the other, along the length of said carrier, each of said main charts containing at least one of the same forms of information, said forms of information positioned within said main chart identically from chart to chart, said forms of information limited in number to facilitate comparison of the content of each of said forms of information within each panel and between said panels, said information within each main chart related to a particular object located within said geographical area,

d. means for referencing each said particular object described in each said main chart to the location along said marginal scale representing the geographical location of said particular object, said referencing means identical in form for each said main chart,

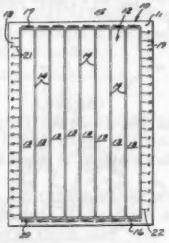
said identical position and same forms of information in each main chart, said identical marginal scales along the edge of said panel and said identical means for referencing each said particular object to the marginal scale combining to facilitate the comparison of the different objects described in each of the main charts both within and between panels.

3,968,574

JOURNALIST TEACHING AID

Gary R. Ellis, 1855 Cedar, Apartment 16, Long Beach, Calif. 90806

Filed Feb. 10, 1975, Ser. No. 548,815
Int. Cl.[2] G09B 29/00
U.S. Cl. 35—7 R **8 Claims**



1. A method of preparation of a full size publication page makeup layout representing a prepared dummy page layout, said dummy page layout further representing a proposed publication page of a class of publications comprising newspapers, tabloids, magazines, pamphlets, manuals, yearbooks, annuals and books, said method comprising:

a. providing a master layout board set, said set comprising a plurality of master layout boards, said plurality including therewithin master layout boards having rectangular dimensions including a range of dimensions representative of a class of proposed publications comprising newspapers, tabloids, magazines, pamphlets, manuals, yearbooks, annuals and books each of said master layout boards having a work surface thereon being divided into substantially equal columns by column dividing strips extending from a master layout board top portion to a master layout board bottom portion, said columns being representative of a column, said columns having a shade or hue differing from the column dividing strips thereby simulating printed matter between the column dividing strips, said master layout boards being constructed of any of the class of materials comprising plastics, epoxy coated paper, epoxy coated card stock, wood, metal, glossy

paper, glossy card stock, painted wood and painted metals, said work surface having a surface preparation thereon to permit detachably adhesively mounting pressure sensitive, adhesively backed materials thereonto;

b. providing an art work simulating set, comprising a plurality of art work simulating sheets, each of said sheets comprising a relatively thin pressure sensitive adhesively backed rectangularly shaped sheet being constructed of any of the class of materials comprising, glossy paper, plastics, plastic coated paper, epoxy coated paper, plastic coated card stock or epoxy coated card stock, said artwork simulating sheets having imprinted on a front face thereof printing indicative of art-work, said plurality of art work simulating sheets including therewithin art-work simulating sheets having rectangular dimensions representing a variety of sizes of art-work or pictures consistent with the publishing art having a range of dimensions within a range of widths of one-half master layout board column wide through four master layout board columns wide and within a range of depths of one-half inch deep through 6 inches deep;

c. providing a headline simulating set comprising a plurality of headline simulating strips for simulating headlines within a range of from one through eight columns wide and one-half inch through 4 inches deep, said strips each comprising a relatively thin pressure sensitive adhesively backed elongate retangularly shaped strip constructed of any of the class of materials as set forth for the construction of the said art-work simulating sheets, said headline simulating strips having on a front face thereof headline simulating printing, including a range of print styles comprising Bodoni, Italic, Optima, Corona, Garamond, Spartan, Roman, Memphis, Gothic, expanded, condensed, Cheltenham, Cairo and Cameo, said plurality of strips further including therewithin printing point sized throughout the range generally used in the publishing art including point sizes of **14, 18, 24, 30, 36, 42, 48, 60** and **72**;

d. providing a flag, nameplate, or logo simulating set comprising a plurality of flag, nameplate or logo simulating strips for simulating flags, nameplates, or logos within the range of from one through eight columns wide and one-half through 4 inches deep, each of said flag, nameplate or logo similating strips having imprinted on a flag, nameplate, or logo simulating strip front face printing distinctively setting said flag, nameplate, or logo simulating strips apart from the said headline simulating strips, said flag, nameplate, or logo simulating strips being otherwise similar in construction to that set forth above for the said construction of headline simulating strips; and

e. detachably adhesively mounting said headline simulating strips, said flag, nameplate or logo simulating strips, and said art-work simulating sheets onto a work surface of a master layout board, said board having dimensions representative of a proposed publication page being represented by a prepared dummy page layout, said mounting of said strips and sheets conforming with information set forth on the prepared dummy page layout, said mounted strips and sheets overlaying columns on the master layout board in conformity with the dummy page layout leaving uncovered columns on the master layout board work surface representing printed story matter of the proposed publication page.

3,968,575

TEACHING DEVICE

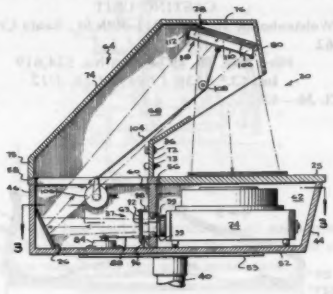
Marlin Van Wilson, Rte. 1, Barboursville, Va. 22923

Filed Apr. 2, 1975, Ser. No. 564,292

Int. Cl.² G09B *5/06*

U.S. Cl. 35—9 A **20 Claims**

1. An audio-visual device which is capable of responding to a student's capability to learn or to absorb a variety of subjects and mode of skills, said audio-visual device comprising a surface mean for displaying a projected visual image on which the student can write, a visual image projecting means for projecting a series of visual images onto the surface means, an audio means for creating an audible signal synchronized with the visual images, a manual advance means for advancing the visual images a predetermined number of visual images, a



manual look-up means for causing additional information to be projected in a particular visual image if the student manually operates the look-up means in completing a lesson taught in said particular visual image, and a control means for advancing the visual images less than said predetermined number of visual images and in relationship to the frequency of manual operation of the look-up button.

3,968,576

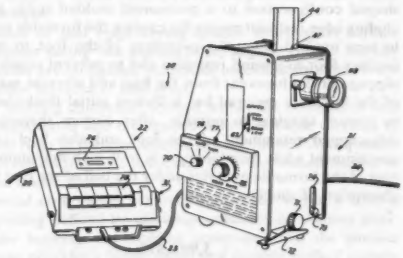
METHOD AND APPARATUS OF AURAL/VISUAL CORRESPONDENCE FOR THE IMPROVEMENT OF READING

Stanford E. Taylor, Hawk Drive, Lloyd Harbor, N.Y. 11743

Continuation-in-part of Ser. No. 599,117, July 25, 1975, abandoned, which is a continuation of Ser. No. 423,271, Dec. 10, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,619

Int. Cl.² G09B *17/04*

U.S. Cl. 35—35 B **5 Claims**



1. A method of aural and visual correspondence for the improvement of reading by training the reader comprising:

viewing a visual program in line-by-line sequence with the print being stationary and a single line being observable during the predetermined viewing time;

transmitting an aural program in the form corresponding to the visual program and including signals to advance the visual program with a single pulse in a predetermined pattern in coordination with the audio program; and

presenting the aural and visual programs slightly out of time sequence one to the other while still maintaining a line of visual material in coordination with the audio program so

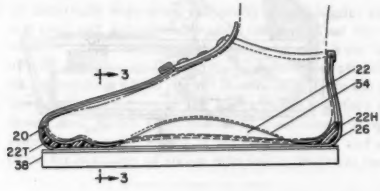
that the rate of both aural and visual presentation are constant one to the other.

3,968,577

METHOD AND CONSTRUCTION OF FOOTWEAR INCORPORATING A CUSTOMIZED, FORM FITTED CASTING UNIT

Lynn Wolstenholme Jackson, 911 30th St., Santa Cruz, Calif. 95062

Filed Nov. 18, 1974, Ser. No. 524,619
Int. Cl.² A43B *13/38, 13/18, 3/12*
U.S. Cl. 36—43 2 Claims



1. An article of footwear having a customized, form-fitted, casting unit for engagement with and support of the undersurface of a person's foot, said casting unit comprising a layer of a formable material having an undersurface on the sole side of the footwear and having an upper surface custom shaped to the contour of the foot, said formable material having sufficient pliability, prior to any curing of the formable material, so as to be displaceable to the exact contour of the underside of the person's foot by the application of the person's weight alone to the top of the casting unit without the necessity of any additional forming means, said casting unit including container means enveloping the formable material for totally enclosing the casting unit to seal off the formable material from the rest of the footwear and for preventing contact of the formable material with the person's foot, said container means including an innersole between the formable material and the person's foot, means for incorporating the casting unit in the article of footwear as an integral part of the footwear, and wherein the formable material is a moldable material and includes a curing agent and the casting unit is cured in the shaped configuration to a permanent molded state, and including edge restraint means for causing the formable material to turn upward along the periphery of the foot to provide positive foot-to-ground response and to prevent rotation and slippage of the footwear from the foot and wherein said layer of the formable material has sufficient initial thickness prior to custom shaping, to provide, after custom shaping, both side-cupped retainment of the foot and also heel and toe containment while maintaining a ⅛ to ¼ inch minimum thickness of the formable material under the ball of the foot for the absorption of shock.

3,968,578

SKI BOAT WITH ADJUSTABLE RIGIDITY

Richard K. Rathmell, 12 Pine Tree Road, Ramsey, N.J. 07446

Filed June 19, 1975, Ser. No. 588,203
Int. Cl.² A43B *5/04*
U.S. Cl. 36—121 6 Claims

1. A ski boot which by itself is relatively flexible in a forward-backward direction, but can be stiffened conveniently by the addition of a removable interlocking stiffening member, wherein the boot has elements that include:

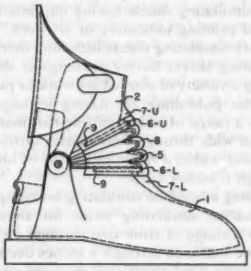
a. a lower section that is relatively stiff and adapted to cover and hold the skier's foot within said section,

b. an upper section that is relatively stiff and adapted to hold the skier's lower leg above the ankle within said section,

c. hinges that connect the said upper section to the said lower section in a manner that allows the upper section to pivot in a forward-backward direction,

d. a flexible section located in the space forward of the hinges and between the upper section and the lower section,

and the boot is uniquely characterized by means provided for a removable stiffening member to be interlocked over the said flexible section and to transmit either compressive or tensile



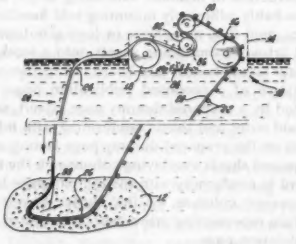
forces from the upper section to the lower section when the upper section is strained in either a forward or backward direction, wherein the said means are shear-resistant projections that interlock into corresponding indentations, and the said projections may extend from the boot sections into the stiffening member or vise-versa from the stiffening member into the boot, and means are provided to hold the stiffening member in a functioning position when the skier prefers the boot to be relatively stiff, or to remove the stiffening member when a relatively flexible boot is preferred.

3,968,579

APPARATUS FOR SEDIMENT DREDGING AND OCEAN MINERAL GATHERING

André M. Rossfelder, 1805 Crespo Drive, La Jolla, Calif. 92037

Filed Feb. 24, 1975, Ser. No. 552,363
Int. Cl.² E21C *3/00*
U.S. Cl. 37—69 15 Claims



1. An apparatus for gathering underwater mineral aggregates comprising:

a. a supporting vessel having means for handling a loop element;

b. a loop element movable between said vessel and an aggregate-gathering position for transporting said aggregates from the ocean floor to said vessel, said loop having an upper descending portion, a lower portion and an upper ascending portion wherein said upper descending portion is buoyant and said lower portion is weighted; and

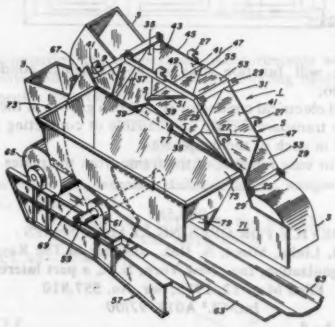
c. means attached to said loop element for holding said aggregates during ascent from the ocean floor to said vessel.

3,968,580

BUCKET WHEEL ASSEMBLY

Raymond P. Lombardi, Pittsburgh; Thomas D. Wertz, Coraopolis, and Ira W. Lakin, Volant, all of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1975, Ser. No. 559,217
Int. Cl.² E02F 3/24
U.S. Cl. 37—189 **12 Claims**



1. A compartmented bucket wheel assembly comprising:
a. a shell structure mounted for rotation about a substantially horizontal shaft and having two axially displaced lateral faces;
b. a plurality of buckets angularly displaced about the periphery of the shell structure for scooping up material as the shell is rotated; and
c. partitions within said shell structure disposed and arranged to define compartments for the buckets which are at least partially open toward the periphery of the shell to receive material from the buckets and which compartment extend diagonally inward and in the direction opposite the direction of shell rotation from the periphery of the shell to trail diagonally behind the buckets, said compartments being provided with deflecting surfaces which slope radially inward and angularly in the direction of shell rotation from one lateral face of the shell toward a discharge edge of extended length in the second lateral face of the shell.

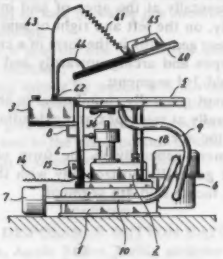
3,968,581

STEAM PRESSER

Fukuyuki Tsunoda, 644, Iizuka-Cho, Katsusika, Tokyo, Japan

Filed Aug. 4, 1975, Ser. No. 601,294
Claims priority, application Japan, Aug. 6, 1974, 49-90440
Int. Cl.² D06F 71/34
U.S. Cl. 38—15 **2 Claims**

1. A steam presser comprising, a steam-spouting press table composed of a mattress member including a steam chamber; a steam-generating chamber disposed under the steam-spouting press table, a base mounting said steam-generating chamber, said steam-generating chamber comprising a heat plate and a lid plate fitted over the heat plate to define a steam-generating space therebetween; compressive water-feed valve means mounted on said steam-generating chamber for feeding necessary amounts of water to the steam-generating chamber; a water tank situated at a higher position beside the compressive water-feed valve means and communicating with said compressive water-feed valve means; a water supply pipe providing communication between said water tank and said water-feed valve; suction means for waste steam disposed beside the steam-generating chamber and communicating with the bottom of said steam-spouting press table; a suction pipe providing communication between said suction means and said steam-spouting press table; a waste-steam tank dis-



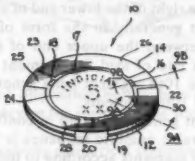
posed beside the base and connected to said suction means; and a discharge pipe for discharging the waste steam sucked by the suction means into said waste steam tank.

3,968,582

GAMING TOKEN AND PROCESS FOR FABRICATING SAME

Bernard B. Jones, 3672 S. Highland, Las Vegas, Nev. 89103

Filed Feb. 6, 1975, Ser. No. 547,560
Int. Cl.² G09F 3/02
U.S. Cl. 40—27.5 **15 Claims**



1. A gaming token comprising:
a. first and second relatively flat annular rings, each having substantially parallel major surfaces and substantially concentric minor surfaces extending between said major surfaces;
b. each of said rings having spaced apart offset surface regions facing like regions of an aligned ring to thereby define preconfigured volumeric indentations beneath the major surfaces of said rings;
c. a molding compound formed within the confines of said indentations and contiguous with the major surfaces of said rings to thereby define a predetermined color pattern corresponding to a particular monetary denomination of the token; and
d. metal coin means removably disposed within a central opening defined by said rings, whereby a common interface between the molding compound and the annular rings provides a highly sharp and durable surface pattern definition for said token.

3,968,583

NUMERIC DISPLAY FOR ARABIC SPEAKING PEOPLE

George A. Allam, 2734-A N. 50th St., Milwaukee, Wis. 53210

Filed Mar. 24, 1975, Ser. No. 561,368
Int. Cl.² G09F 9/30
U.S. Cl. 40—125 E **6 Claims**

1. A display device comprising a cluster of segments which segments may be utilized alone or in combination with others to graphically display numerals as written in the Arabic language, the segments being arranged as follows;

1st and 2nd rhomboidal segments arranged generally in the form of an inverted V with said 2nd segment being on the right of and longer than said 1st segment;

3rd and 4th generally rectangular segments disposed generally horizontally at the apex of said inverted V and, respectively, on the left and right of said apex;

a 5th segment generally in the form of a crescent originating at said apex and arcing upwardly and then downwardly above said 3rd segment;

a 6th segment generally rhomboidal in shape and originating generally at said apex and extending upwardly to the right of the apex;

a 7th segment generally in the form of a semi-crescent disposed generally horizontally with the flat end of the segment facing said 4th segment;

an 8th segment generally of rhomboidal shape disposed between the lower end of the 2nd segment and the right end of the 4th segment;

a 9th segment generally rectangular in shape disposed horizontally to the right of the lower end of said 2nd segment;

a 10th segment generally in the form of a semi-crescent positioned between the upper end of said 8th segment and the right end of said 9th segment with the pseudo centers of the 10th segment lying generally between the 8th, 9th, and 10th segments;

an 11th segment generally square in configuration;

whereby the Arabic numeric sequence is formed by use or display of the segments according to the following schedule:

Numeral	Segments Used
1	2
2	2 and 4
3	2, 4, 7
4	6, 4, 8, 9
5	8, 9, 10
6	2, 3
7	2, 8
8	1, 2
9	2, 3, 5
0	11

3,968,584
ILLUMINATED SIGN

Willard L. Kingston, 225 W. Forest St., Brigham City, Utah 84302

Filed July 18, 1974, Ser. No. 489,770
Int. Cl.² G09F *13/18*
U.S. Cl. 40—130 K **6 Claims**

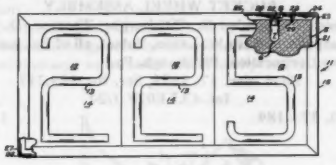
1. An illuminated sign comprising:

a transparent light-source plate having cavities in the edges thereof and having an opaque surface and a translucent surface, both surfaces being internally reflective;

a plurality of electric lamps, one seated for frictional retention in each of the cavities with its terminals extending outwardly;

at least one opaque plate fitted over the translucent surface of the light-source plate, each opaque plate having a character therein covered on at least one side with opaque material except for the character;

a frame surrounding the edges of the plates and comprising an externally insulated channel that confines the transparent and opaque plates between its flanges, and, further including electrically-conductive means fixed inside the channel that may contact lamp terminals, so that the



frame will function also as an electrical conductor thereto;

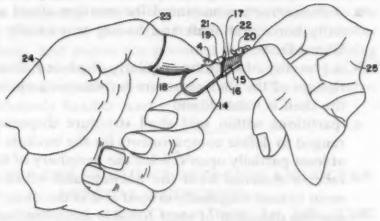
a second electrical conductor seated in a groove in the edge of the transparent plate and capable of contacting a terminal in each of the lamps; and

means for easy removal of the frame from the plates.

3,968,585
DEVICE FOR OPENING LEADER SNAPS

Jaromir B. Linha, Minot, N. Dak., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 12, 1975, Ser. No. 557,810
Int. Cl.² A01K *97/00*
U.S. Cl. 43—4 **3 Claims**



1. A device for opening leader snaps having a resilient wire element, said device comprising

a substantially thimble-like member worn on the thumb of a hand of a fisherman and having a wedge-like member approximating a fingernail extending therefrom, said wedge-like member having spaced notches formed therein and extending from the edge thereof, said notches being sized and shaped to receive and manipulate said resilient wire element.

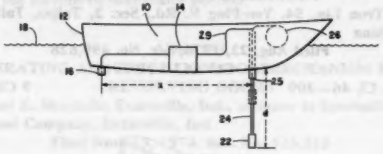
3,968,586
METHOD FOR FINDING TEMPERATURE ENVIRONMENTS FOR FISH

Glen Peterson, Tulsa, Okla., assignor to Richard E. Fowlkes, Tulsa, Okla., a part interest

Division of Ser. No. 334,077, Feb. 20, 1973. This application Jan. 6, 1975, Ser. No. 538,714
Int. Cl.² A01K *73/02*
U.S. Cl. 43—4.5 **3 Claims**

1. A method for locating specific varieties of fish comprising the steps of making at least one pass over an area of water with a boat having thereon a pair of longitudinally spaced temperature measuring devices disposed in the water, taking differential temperature measurements immediately beneath the surface of the water during each such pass for determining a temperature variance of the water near the surface thereof as a projection of subsurface temperature variations, making at least one depth versus temperature measurement by lowering

one of said temperature measuring devices further beneath the surface of the water for determining the temperature variance of the water with respect to the depth of the water,



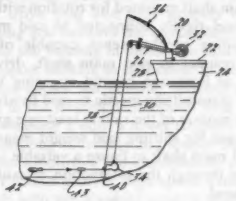
and comparing the temperature measurements with known fish environment reference data for locating likely positions for specific varieties of fish.

3,968,587

DOWNRIGGER

James Allen Kammeraad, Holland, Mich., assignor to DFK Inc., Holland, Mich.

Filed July 21, 1975, Ser. No. 597,412
Int. Cl.² A01K 89/00
U.S. Cl. 43—27.4 10 Claims



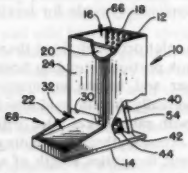
1. A downrigger comprising, in combination, a base adapted to be secured to a watercraft, a base housing indexably mounted on said base, a boom pivotally mounted on said base housing, a cable reel secured to said base housing in alignment with said boom, means on said base housing for releasably securing a fishing rod thereto, means for releasably locking said base housing to said base in a selected indexed position, said boom including a plurality of sections disposed in telescoping extensible relationship, and means for locking said sections in a selected longitudinal position relative to each other.

3,968,588

FISH CLAMPING APPARATUS

Roy L. Peterson, Sr., Rte. 1 Box 217, Wewahitchka, Fla. 32465

Filed July 29, 1975, Ser. No. 600,152
Int. Cl.² A01K 97/00
U.S. Cl. 43—53.5 9 Claims



1. A clamping apparatus for grasping and holding a live, hooked fish between fixed and movable jaws comprising spaced walls defining an upwardly opening housing, a movable jaw member, a fixed jaw member, said fixed jaw member being formed on one of said walls; said movable jaw member having a medial and opposed distal portions, means by which said medial portion of said movable jaw member is pivotally secured to said housing;

means forming a jaw on one said distal portion of said movable jaw member;

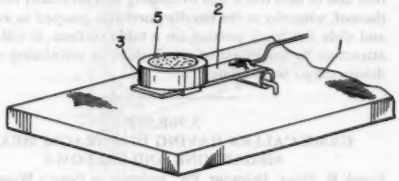
a pedal including means by which it is movably affixed to said housing; said pedal having a movable free end portion; a toggle pivotally connected to said free end portion of said pedal and to the distal portion of said movable jaw member which is opposed to said jaw.

3,968,589

PRELOADED DISPOSABLE BUTTON BAIT DEVICE

Monte C. Basham, Apple Valley, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1975, Ser. No. 563,625
Int. Cl.² A01M 23/24
U.S. Cl. 43—81 2 Claims



1. A preloaded disposable button bait device for a trap having a trigger device for springing the trap, said bait device comprising

an open substantially cylindrical container of bait having a substantially circular bottom and an open top, said container being preloaded with animal bait; and

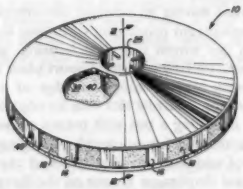
a pair of arms affixed to and extending substantially parallel to the bottom of the container in diametrically opposed spaced relation therewith whereby the container is removably mounted on the trigger device of a trap and maintained thereon via said arms.

3,968,590

INSECT TRAP

Roger L. Kitterman, Tonopah, Ariz., assignor to Wilbur-Ellis Company, San Francisco, Calif.

Filed Apr. 7, 1975, Ser. No. 565,429
Int. Cl.² A01M 1/14
U.S. Cl. 43—114 5 Claims

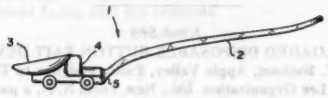


1. A trap for control and monitoring of the insect population; said trap comprising:

a. a detachable insect trap panel coated with a trap substance;

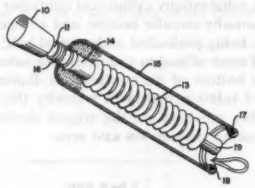
b. a substantially impervious cover; and
c. mounting means associated with said cover adapted to releasably engage said panel in a position spaced apart and subjacent said cover.

3,968,591
COMBINED SPOON AND TOY
Karl Henry Pearson, Jr., R.D. No. 1, Prosperity, Pa. 15329
Filed Dec. 6, 1971, Ser. No. 205,218
Int. Cl.² A63H *33/00*
U.S. Cl. 46—1 R **1 Claim**



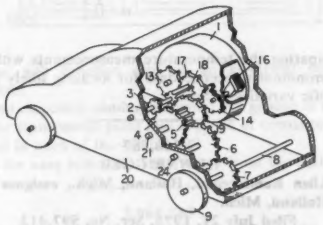
1. A combined spoon and toy for feeding an infant or small child, comprising a ladle like portion integrally secured to and extending forwardly in front of a portion simulating a truck, and a handle portion having one end integrally attached to the rear end of said truck and extending longitudinally rearwardly thereof, whereby as the handle portion is grasped so as to push and slide the truck portion on a table surface, it will provide attraction to the infant or small child by simulating a motor-driven cargo for feeding.

3,968,592
GAME CALLER HAVING DIAPHRAGM MEANS, MEGAPHONE AND BELLOWS
Frank R. Piper, Delmont, Pa., assignor to Penn's Woods Products, Inc., Delmont, Pa.
Filed Aug. 23, 1974, Ser. No. 499,838
Int. Cl.² G10K *9/02*, *9/18*
U.S. Cl. 46—178 **7 Claims**



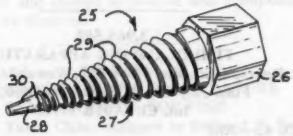
1. A game calling device to simulate the sounds made by wild game, said device comprising:
a first housing having a flange at one end thereof,
a truncated conical megaphone housing secured at the end thereof having the smallest diameter to the other end of said first housing with the interiors of said housings in communication,
a support plate having an opening therethrough,
diaphragm means for producing vibrations in the column of air which lies within said first housing, said diaphragm means being carried by said support plate in an overlying relation with said opening, an edge of said diaphragm means forming a narrow slot with an edge in the opening,
an end cap including a rim with means projecting from the periphery thereof for releasably engaging the flange at one end of said first housing, said end cap receiving and holding said diaphragm means on the flanged end of said first housing, and
an elongated flexible and resilient bellows having a wall at one end thereof with an exhaust opening therein adapted to be closed by elastic deformation for producing bursts of air, said bellows being secured at its other end in open communication with said first housing for the passage of the bursts of air into said first housing to vibrate said diaphragm means.

3,968,593
VARIABLE-INERTIA FLYWHEEL
Shi-Tron Lin, 54, Yen-Ping N. Rd., Sec. 2, Taipei, Taiwan, China
Filed Aug. 22, 1974, Ser. No. 499,628
Int. Cl.² A63H *29/20*
U.S. Cl. 46—209 **9 Claims**



1. A vehicle comprising a vehicle body including at least one ground engaging wheel rotatably connected to said vehicle body, a main shaft mounted for rotation within said vehicle body, a flywheel rigidly connected to said main shaft, said flywheel including weight means capable of being shifted radially with respect to said main shaft, drive train means between said at least one ground engaging wheel and said main shaft for transmitting inertia to said flywheel in response to the rotative motion of the said at least one ground engaging wheel and means for shifting said weight means radially with respect to said main shaft to cause a variable inertia response in said vehicle through the interaction of said weight means and said flywheel.

3,968,594
METHOD AND APPARATUS FOR THE CHEMICAL TREATMENT OF TREES
George S. Kawakami, 810 1/2 E. 31st St., Kansas City, Mo. 64109
Continuation of Ser. No. 461,012, Aug. 15, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,476
Int. Cl.² A01G *29/00*
U.S. Cl. 47—57.5 **1 Claim**



1. A self-tapping applicator nozzle for treating trees comprising:
a socket having an inlet orifice defined therein, a substantially straight shank portion extending from said socket in a tapered manner and having an interior passageway extending longitudinally therein, said interior passageway communicating with said socket inlet orifice, said shank portion having external threads winding continuously thereon throughout the entire length of said shank portion and arranged to permit the threadable advancement of said shank portion into a tree, said shank portion being exteriorly imperforate the entire length thereof;

a non-threaded tip connected to the end of said shank portion remote from said socket, said interior passageway terminating within said tip; and

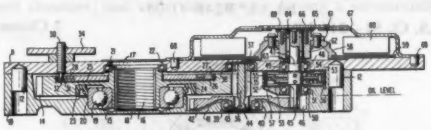
a plurality of output orifices extending transversely in said tip from said interior passageway to the exterior of said tip, all of said orifices being located in said tip and beyond the threads of said shank portion.

3,968,595

OPERATING AND SPEED CONTROL MECHANISM FOR REVOLVING DOORS

Amuel E. Sheckells, Evansville, Ind., assignor to International Steel Company, Evansville, Ind.

Filed Nov. 13, 1974, Ser. No. 523,415
Int. Cl.² E05D *15/02*
U.S. Cl. 49—43 14 Claims



1. A low profile operating mechanism for revolving doors comprising a shallow top opening mechanism housing and a cover plate for said housing attached to the top thereof and spanning and covering the open top of the housing, a main revolving door drive gear and gear support bearing means within the housing and beneath the cover plate, an intermediate pinion within the housing in mesh with said main gear and having a top support bearing in said cover plate, an umbrella-like Evoloid gear within the housing beneath the main gear and being fixed to the intermediate pinion near the bottom of the housing and having a hub, a lower support bearing in the bottom of the housing receiving and supporting the Evoloid gear hub and also supporting the intermediate pinion which is affixed to the Evoloid gear, a high speed pinion within the housing in mesh with the Evoloid gear, a shaft carrying the high speed pinion and extending thereabove, an upper support bearing for the high speed pinion shaft on said cover plate, a lower bearing for the pinion shaft within said housing above the Evoloid gear, whereby the high speed pinion is cantilevered below said lower bearing for the high speed pinion shaft, and a centrifugal friction brake assembly secured to the high speed pinion shaft and turning therewith relative to the stationary brake drum within the tip portion of the housing and being formed integral therewith and integral with a seat for said lower high speed pinion shaft.

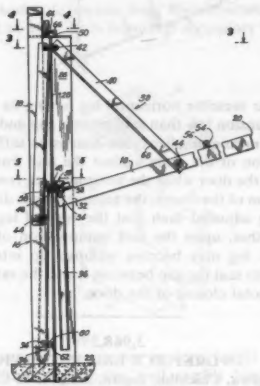
3,968,596

VEHICLE BARRIERS

Alex Danin, 1080 Mamaroneck Ave., White Plains, N.Y. 10605

Filed Sept. 19, 1974, Ser. No. 507,348
Int. Cl.² E01F *13/00*
U.S. Cl. 49—49 11 Claims

1. In a system for at least temporarily preventing the travel of at least one vehicle along at least one path, upright support means situated beside said path, an elongated barrier arm having a blocking position projecting laterally from said upright support means across said path for preventing a vehicle from traveling past said barrier arm along said path when said barrier arm is in said blocking position thereof, and connecting means connecting said barrier arm to said upright support means for swinging movement with respect thereto about a substantially horizontal axis between said blocking position extending across said path and a non-blocking position where said barrier arm extends substantially vertically along said upright support means to be situated with the latter beside said path to permit a vehicle to travel therealong, said connecting means connecting said arm to said support means for swinging movement in an upward direction from said blocking to said non-blocking position and in a downward direction from said non-blocking to said blocking position, and said axis around which said arm swings being situated at the region of a lower end of said arm when the latter is in said non-blocking position thereof, said connecting means having a portion pivotally connected with said arm between opposed ends thereof for turnably supporting said arm between said opposed ends for swinging movement not only with respect to said substantially horizontal axis but also with respect to said portion of said connecting means, whereby one part of said arm on one side of said portion of said connecting means serves at least partially to counterbalance another part of said arm on the other side of said portion of said connecting means, a pair of said barrier arms being connected by a pair of said connecting means to a common upright support means for swinging movement with respect thereto about a pair of said substantially horizontal axes between a pair of blocking positions where said arms respectively project laterally in opposite directions from said common upright support means across a



pair of paths which are situated beside each other with said upright support means located therebetween, and said arms when in their non-blocking positions extending substantially vertically and located closely adjacent to each other while extending along said upright support means, said paths respectively leading to a pair of parking spaces which are situated beside each other and access to which is prevented by said arms when the latter are in their blocking positions, the system including a row of said parking spaces separated from each other by boundary lines and said upright support means with said pair of barrier arms connected thereto by said pair of connecting means being situated only at every other boundary line while the remaining boundary lines are completely free and unobstructed, said barrier arms being sufficiently long to extend when in their blocking positions between a pair of successive upright support means through distances sufficiently great to separate the free ends of a pair of barrier arms which extend toward each other from a pair of successive upright support means by a distance which is too small to permit a vehicle to pass through the space between said free ends.

3,968,597

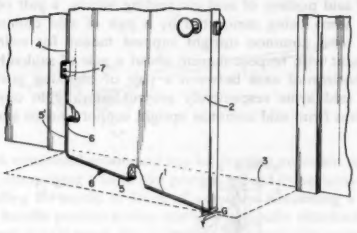
CLOSURE SEAL AND METHOD

Parker W. Hirtle, Lexington, Mass., assignor to Bolt Beranek and Newman, Inc., Cambridge, Mass.

Filed Jan. 13, 1972, Ser. No. 217,534
Int. Cl.² E06B *7/16*
U.S. Cl. 49—477 2 Claims

1. Apparatus for acoustically sealing an edge such as the bottom edge of a closure such as a door that is mounted along

a different edge thereof within a corresponding frame, with a greater gap between the bottom edge and the adjacent bottom of the frame than that between the mounting edge and its adjacent frame edge, the apparatus having, in combination a single-piece airtight L-shaped resilient tubular member of substantially uniform long-oval cross-section throughout its length mounted with its horizontal leg extending externally along the door bottom edge and its vertical leg extending externally along at least the adjacent region of the said mounting edge, the member being oriented so that the smaller cross-dimension of each leg is perpendicular to the associated edge,



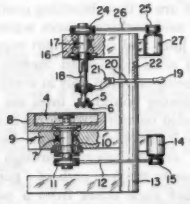
the tubular member horizontal leg having its normal smaller cross-dimension less than said greater gap and the vertical leg having its normal smaller cross-dimension sufficient to enable compression of the same against the said frame edge during closing of the door while the horizontal leg remains free of the said bottom of the frame, the relative length dimensions of the legs being adjusted such that the vertical leg contains sufficient air that, upon the said compression of the same, the horizontal leg may become pumped up into an expansion sufficient to seal the gap between it and the said bottom of the frame at total closing of the door.

3,968,598

WORKPIECE LAPPING DEVICE

Haruo Ogawa, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of Japan

Continuation of Ser. No. 324,781, Jan. 18, 1974, abandoned. This application Sept. 30, 1974, Ser. No. 510,781
Claims priority, application Japan, Jan. 20, 1972, 47-7771
Int. Cl.[2] B24B *7/04, 7/16*
U.S. Cl. 51—55 **5 Claims**



1. A grain processing machine comprising supporting means for supporting work to be processed, a first rotation driving motor including a rotating shaft for rotating said supporting means in one direction, a rotating member for grain processing disposed opposite to said work to be processed, a rotating shaft for said rotating member, the rotating shaft of said rotating member being offset from the rotating shaft of said supporting means, a second driving motor for rotating said rotating member in the same direction as said supporting means in a way in which a path that an arbitrary point on said work makes on said rotating member is helical and the difference in the number of rotations between said rotating member and said work to be processed is not more than 30% but more than 0%, and means for shifting said rotating shaft of said rotating member,

the rotating shaft of said first rotation driving motor being provided at a fixed position and the rotating shaft of said rotating member for grain processing being pivotable in an arcuate manner,

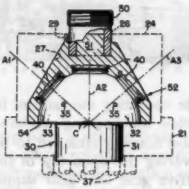
said rotating member for grain processing being secured at one end of a table journaled to a shaft and the other end of said table being eccentrically driven by a rotating means.

3,968,599

LENS BLOCKING TOOLS

Charles L. Gill, Dresden, N.Y., assignor to Harris, Beach & Wilcox and Angelo Pelino, part interest to each

Division of Ser. No. 311,399, Dec. 1, 1972, Pat. No. 3,866,660. This application Sept. 17, 1974, Ser. No. 506,868
Int. Cl.[2] B24B *41/06*
U.S. Cl. 51—216 LP **7 Claims**



1. A tool for accurately holding a plurality of lens blanks for simultaneous generation thereof on a surfacing machine or the like, comprising

a molded body having on one end a segmental spherical surface,

a plurality of spaced inserts substantially completely embedded at their inner ends in said body so that only the outer ends of the inserts extend to the exterior of said body and register with said spherical surface, each of said inserts having in its outer end a circular recess opening on said spherical surface with the axis of the recess extending through the center of curvature of said surface, and with said recess in each insert being disposed to have a lens blank adhered therein for a surfacing operation, and

a shank projecting from the opposite end of said body coaxially of said surface for mounting the tool in a lens surfac ing machine,

said body of the tool being molded from a material having a melting point lower than the material from which said inserts are made, whereby after use the body of the tool may be melted and the inserts may be recovered and saved for future use.

3,968,600

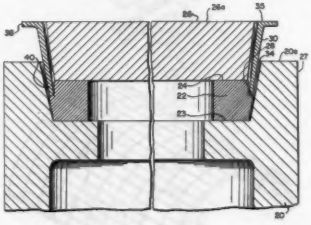
ADJUSTABLE MANHOLE COVER SUPPORT STRUCTURE

Harold M. Bowman, Bay Village, Ohio, assignor to National Utility Products Company, Cleveland, Ohio

Continuation of Ser. No. 286,115, Sept. 5, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,817
Int. Cl.[2] E02D *29/14*
U.S. Cl. 52—19 **8 Claims**

1. A manhole cover support structure to vertically adjust and support a manhole cover in a manhole frame, wherein the manhole frame is supported in a manhole housing and has an upwardly facing shoulder circumscribed by an upwardly projecting collar-like portion defining the manhole opening, a manhole cover normally engaged with and supported on said shoulder, with said cover substantially completely filling said opening, except for predetermined generally unobstructed lateral clearance between said cover and the confronting

interior surface of said collar-like portion, a cover adjusting insert resting on said shoulder and having an upper cover supporting surface on which said cover rests in adjusted, elevated position relative to the shoulder of said frame, the outer peripheral edge of said cover spaced laterally from said interior surface of said collar-like portion in said adjusted, elevated position of said cover, and a separate relatively thin lateral support ring resting on said cover support insert and disposed in the last mentioned lateral space between said interior surface of said collar-like portion and said outer edge of said cover, to restrain against lateral movement relative to the frame, the full weight of said cover being supported directly by said cover adjusting insert in said adjusted elevated position of said cover, and wherein said interior surface of said collar-like portion of said frame slopes downwardly and inwardly terminating at its lower edge at the outer periphery of said shoulder, said collar-like portion having a substantially



horizontal top surface, said adjusting insert having an outer side surface which tapers inwardly in a downward direction and which last mentioned side surface is disposed in confronting generally closely spaced relation to said interior surface, and said support ring including a defining wall structure which on its outer side surface is tapered inwardly in a downward direction and generally complementary to the taper on said outer side surface of said adjusting insert, said support ring having an inner downwardly and inwardly sloped defining side surface, and said cover comprising an outer defining side surface which is sloped generally complementary to said sloped inner defining side surface of said support ring, said cover and ring confronting side surfaces being disposed in generally laterally spaced relation to one another, and with the top surfaces of said cover and said support ring being disposed at substantially the same elevation and with said top surface of said support ring being disposed in elevated condition relative to said top surface of said collar-like portion.

3,968,601

HANDHOLE TO RECEIVE AND LOCATE CONNECTIONS OF UNDERGROUND SECONDARY ELECTRICAL POWER CABLE TERMINATIONS

Clayton S. Brown, 8021 Juanita Drive, Kirkland, Wash. 98003, and Joseph Jacobs, 18221-3rd Place, SW., Seattle, Wash. 98166

Continuation of Ser. No. 373,015, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 116,346, Feb. 18, 1971, abandoned. This application Dec. 19, 1974, Ser. No. 534,473

Int. Cl.[2] E02D *29/10*

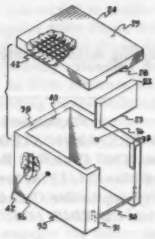
U.S. Cl. 52—21 **6 Claims**

1. Secondary handhole means, adapted to be installed in the ground with its top adjacent ground level, for receiving terminal portions of underground secondary wiring cables and their connectors, comprising:

a. a one-piece integral unitary upstanding substantially surrounding body structure comprising vertical wall means for defining said structure;

b. means defining a completely open horizontal top entry on said body structure and a single complementary vertical entry through said vertical wall means, joining said horizontal top entry, for forming a complete lay in lift out underground secondary cable entry, receiving the terminal portions of underground secondary wiring cables and their connectors which may come in at different elevations and all from the same general direction whereby such cables and connectors may be easily lifted by their ends from said secondary handhole means to a convenient standup working height for alterations, additions or repairs, and readily lowered and replaced in said secondary handhole means after such alterations, additions or repairs;

c. means defining a completely transverse horizontal clear lower entry at the bottom of said body structure joining said vertical entry, for receiving underground secondary cables which may come into said secondary handhole means from therebeneath, said lower entry, vertical entry and top entry forming an open slot completely vertically through said secondary handhole means whereby such underground secondary cables which may come into said secondary handhole means from therebeneath may be easily lifted by their ends from said secondary handhole



means to a convenient standup working height for alterations, additions or repairs, and readily lowered and replaced in said secondary handhole means after such alterations, additions or repairs;

d. opposed lower portions of said vertical wall means further comprising means defining a plurality of pairs of opposed hole means therein and a removable, relocatable, reinforcing member selectively insertable into a complementary pair of said hole means whereby said reinforcing member is selectively optionally relocatable further from said vertical entry to clear and support entering cable terminations at varying angles of entry from respective underground depths;

e. A removable gate placed substantially across a top portion of said vertical entry, the top of the gate being located flush against such horizontal top entry, the bottom of the gate being located well above the plane of said lower entry, said gate thus providing a strong structural cross member for said body structure and a clear opening therebeneath for underground secondary cables positioned therethrough; and

f. a removable cover placed over said body structure, completely covering said horizontal top entry.

3,968,602

PROTECTIVE WORKMAN AND EQUIPMENT COVERS

Frank L. Mitchell, 4929 S. Troost, Tulsa, Okla. 74105

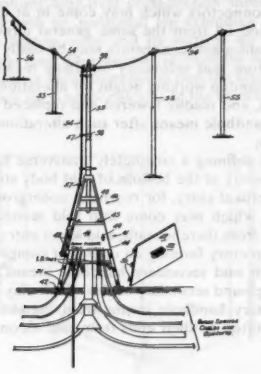
Filed Jan. 24, 1975, Ser. No. 543,874

Int. Cl.[2] E04H *12/00;* **E04C** *3/30*

U.S. Cl. 52—40 **5 Claims**

1. Equipment and personnel protection means comprising a tower, said tower being placed near the emerging position of underground buried cables and conduits, ground contacting feet for supporting the tower, a lower completely enclosed, bottom half of the tower with side panels and a horizontal top

panel midway up the tower sealed to the side panels, an open work upper half of the tower connected to the lower section,



and cable supporting means mounted on the upper half of the tower.

3,968,603

PANEL FOR PREFABRICATED METAL BUILDINGS

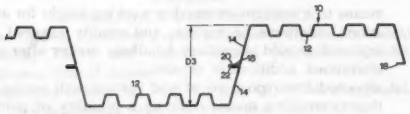
Karol J. Merson, 1307 Crossfield Bend, Mississagua, Canada

Filed Mar. 25, 1974, Ser. No. 454,149

Claims priority, application Canada, May 15, 1973, 171581

Int. Cl.[2] E04B *1/32;* E04C *2/32*

U.S. Cl. 52—86 **3 Claims**



1. In a prefabricated sheet metal building, a composite wall panel comprising:

multiple first and second complementary sheet metal members alternately interconnected in series, each member being longitudinally elongated and longitudinally curved to conform with a common arc of curvature of the wall panel;

said first sheet metal members each having a base wall curving with said common arc but located radially inside the arc and having longitudinal reinforcing ribs comprising radially extending corrugations, and each first member having a pair of opposed side walls forming with said base wall a U-shaped cross-sectional configuration, said side walls projecting radially outwardly beyond said corrugations and terminating in longitudinal locking flanges respectively located along said common arc;

said second sheet metal members each having a base wall curving with said common arc but located radially outside the arc and having longitudinal reinforcing ribs comprising radially extending corrugations, and each second member having a pair of opposed side walls forming with said base wall a U-shaped cross-sectional configuration, said side walls projecting radially inwardly beyond said corrugations and terminating in longitudinal locking flanges respectively located along said common arc; and

the side walls of the first and second sheet metal members meeting with their respective locking flanges interconnected at said common arc and with their side walls aligned so that they occupy a common plane extending from the locking flanges to the respective base walls of the members, the locking flanges of said members including flange portions following the curvature of said common arc and disposed substantially at right angles to said common plane so that when the members are interconnected the flange portions will unite in radially abutting mutual relationship.

3,968,604

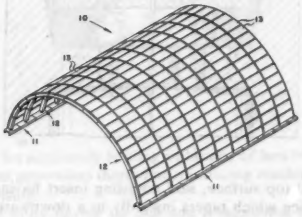
ERECTABLE SHELTER STRUCTURE AND METHOD OF ERECTION

James F. Hills, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 2, 1974, Ser. No. 494,350

Int. Cl.[2] E04B *1/35;* E04G *21/00*

U.S. Cl. 52—86 **28 Claims**



1. A shelter or building assembly that may be both erected and disassembled for relocation and erection elsewhere with all assembly, erection and disassembly accomplished without elevation of any personnel from the base level of a location site comprising in combination:

a pair of elongated base rail means located longitudinally coextensive and equidistant laterally spaced from each other at the location site;

a plurality of arch beam means each having a linear distance between the ends thereof substantially equal to the lateral spacing between the pair of base rail means;

connection means consisting of first members mounted and spaced along said base rail means and second members on the ends of said arch beam means, said first and second members adapted for pivotal connection together by a pin means on axes substantially perpendicular to the longitudinal elongation of said base rail means and substantially parallel to the planes defined by said arch beam means whereby the ends of said arch beam means may be connected to said base rail means while an arch beam means is substantially parallel to the location site surface before pivotal raising of the arch beam means to an erected position;

each pair of adjacent arch beam means when located in their erected positions forming an arch frame between the pair of base rail means, and

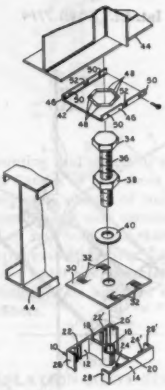
a plurality of individual panel means each adapted to slidably and retainably engage each of a pair of adjacent arch beam means and to sealingly engage with adjacent panel means in the same arch frame, the plurality of panel means when installed in each said arch frame constituting inclement weather-sealed arch frame shelter covers and the only means for retaining said arch beam means pivotally connected to said base rail means in their upright erected positions.

3,968,605

ADJUSTABLE COLUMN FOR BUILDINGS

Richard A. Lovgren, Allison Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 27, 1974, Ser. No. 536,876
Int. Cl.² E02D 35/00
U.S. Cl. 52—126 4 Claims



1. An adjustable load-bearing column assembly for supporting beams and the like comprising

an elongated generally H-shaped metal column having a pair of spaced parallel side wall segments integrally joined together over the full length thereof by a transverse web compositely constituted of an intermediate generally C-shaped tubular core and a pair of web segments extending therefrom and joined to the midpoint of said side wall segments,

a bearing plate adapted to be secured to overlying abutting relationship with the upper end of said column, said plate having a generally circular opening concentric with and overlying the centrally disposed C-shaped tubular core of said column,

a bolt member having a threaded shaft with a selectively contoured head at one end thereof and a nut member in rotatable threaded engagement therewith, the undersurface of said nut being disposed in supportive facing relation with the upper surface of said bearing plate and with the portion of said threaded shaft of said bolt disposed beneath said nut extending through the aperture in said bearing plate and into said C-shaped tubular core of said column,

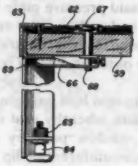
a bracket member disposable in abutting embracive engagement with the undersurface of a beam to be supported having a complementally shaped opening therein sized to non-rotatably receive and contain said head of said bolt to prevent the bolt from being rotatably displaced when said nut is turned to effect vertical displacement thereof.

3,968,606

PORTABLE ROSTRUM

Odie D. Facemire, Clark Road, Shirley, Mass. 01464

Continuation of Ser. No. 311,629, Dec. 4, 1972, abandoned, which is a division of Ser. No. 141,942, May 10, 1971, abandoned, which is a continuation of Ser. No. 39,647, May 22, 1970, abandoned, which is a division of Ser. No. 849,561, July 23, 1969, Pat. No. 3,531,898, which is a continuation of Ser. No. 640,590, May 23, 1967, abandoned. This application Aug. 30, 1974, Ser. No. 501,996
Int. Cl.² E04H 3/10
U.S. Cl. 52—127 3 Claims



1. A portable rostrum, comprising

a. a unit adapted to be connected to similar units, the unit consisting of a rectangular main frame from each corner of which extends a short leg, the frame being formed of angle iron with an upwardly-extending flange extending around its periphery to form a recess, and an inwardly- and horizontally-extending flange defining an opening,

b. a continuous rigid rectangular floor removably carried in the recess and covering the opening, the floor having its upper surface covered with a rug material,

c. a fastening means extending downwardly from the floor and movable from a first position in which the floor is removable from the frame to a second position in which the fastening means engages the underside of the frame and locks the floor in the frame against removal,

d. a controller positioned at the upper surface of the floor and adapted to effect the movement of the fastening means when the controller is rotated, and

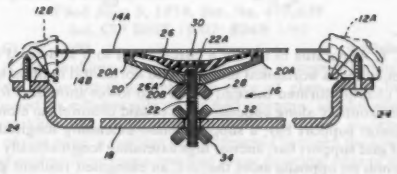
e. a clamp adapted to hold the unit in contact with the similar units.

3,968,607

APPARATUS FOR REDUCING WINDOW BREAKAGE BY WIND PRESSURE

Robert J. Baran, 1021 Harrington, College Station, Tex. 77840

Filed Jan. 21, 1975, Ser. No. 542,769
Int. Cl.² E04H 14/00; E06B 5/12
U.S. Cl. 52—173 R 1 Claim



1. Apparatus for use on a window pane having a frame with opposite sides, the apparatus being used for increasing the positive and negative failure pressure of the window pane when subjected to wind forces, comprising:

a rigid bracket having means at each end for affixing to a window frame and positionable to extend from one side to the opposite side of the window frame, the bracket being spaced from the window pane and generally paral-

lel to it and having an opening therein intermediate the ends;

a rigid pressure plate body having a forward side and a rearward side, the forward side having an integral peripheral forward extending lip portion, the body having a central opening therethrough, the lip portion providing a flat forward planar contacting surface;

a diaphragm of thin flat resilient impervious material of shape and dimension at least equal said pressure plate body peripheral lip portion contacting surface, the diaphragm being positioned between said pressure plate body peripheral lip portion planar conducting surface and the window pane;

a bolt received in said pressure plate body opening, the bolt having an inner end and an outer end, the inner end of the bolt being secured to the central portion of said diaphragm and the outer end being received in said opening in said bracket;

a nut threaded onto said bolt engaging said rearward side of said pressure plate whereby said diaphragm may be applied against a window pane by engagement with said pressure plate circumferential lip portion and said diaphragm central portion partially withdrawn by said bolt to thereby create a vacuum to secure said diaphragm and said pressure plate to the window pane; and

nuts received on said bolt to either side of said bracket, the force exerted by said body peripheral lip portion through said diaphragm serving to resist positive wind pressure on the window pane and the vacuum force applied by said diaphragm serving to resist negative wind pressure on the window pane.

3,968,608

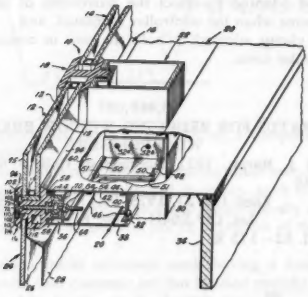
CURTAIN WALL PANEL SUPPORT

Billy J. Swango, 4141 N. St. Augustine, Dallas, Tex. 75227

Filed Aug. 12, 1974, Ser. No. 496,646

Int. Cl.² E04B *1/66*; E06B *3/62*

U.S. Cl. 52—235 **5 Claims**



1. Apparatus to secure a curtain wall to a structural frame including: a horizontal mullion, said horizontal mullion having a channel formed therein; upper and lower shoulders formed horizontally along opposite sides of said channel; an elongated gasket support bar; a support tenon extending longitudinally of said support bar; anchor lugs extending longitudinally of the tenon on opposite sides thereof; an elongated resilient gasket, said gasket having a groove formed longitudinally in the inner face of said gasket of such shape and dimension as to receive said tenon and anchor lugs, said tenon and anchor lugs being disposed in and extending longitudinally of said groove, said anchor lugs being positioned adjacent said upper and lower shoulders, said gasket having upper and lower panel-receiving slots formed along opposite faces thereon, the upper slot being positioned above said tenon such that the tenon supports a panel disposed in the slot above the gasket, said gasket having abutment faces formed longitudinally of the gasket extending outwardly of the inner face of the gasket; and means to draw said support bar and abutment surfaces into said channel between said upper and lower shoulders to restrain said gasket about said tenon and anchor lugs and secure said support bar and gasket to said horizontal mullion.

3,968,609

ASSEMBLY FOR FORMING A STRUCTURE HAVING GENERALLY CURVED SURFACES

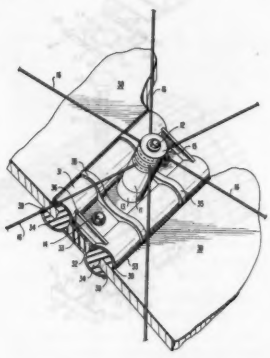
Ernst Deutsch, and Bernhard Reifenscheid, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Filed Apr. 1, 1974, Ser. No. 457,214

Claims priority, application Germany, Mar. 31, 1973, 2316175

Int. Cl.² E04B *7/14*

U.S. Cl. 52—245 **17 Claims**



1. Assembly for sheathing a network thereby forming a structure having generally curved surfaces comprising:

a. a connector panel or strip adapted to be joined to the network via a firm or elastic intermediate element, said connector panel or strip comprising at least two associated clamping plates and a filling panel therebetween to regulate the distance between the individual clamping plates or strips, said connector panel or strip holding two bearing profile members of a weather-resistant and aging-resistant vulcanized elastomer, and

b. a covering panel attached to at least one of the bearing profile members held by the connector panel or strip, said covering panel being shaped to fit said network.

3,968,610

FACING STRUCTURES FOR BUILDING

Robert S. Medow, 16000 Kelmarnock Drive, Miami Lakes, Fla. 33014

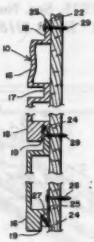
Filed Dec. 9, 1974, Ser. No. 530,827

Int. Cl.² E04D *3/361*

U.S. Cl. 52—314 **1 Claim**

1. A facing panel structure for walls of a building comprising a plurality of sheets of substantially rectangular material whose outer surface is contoured for simulating at least one of various construction facing materials, positioned thereon in spaced relation with each other and with mortar line portions simulated between said construction material, each of said sheets having flange portions extending along its edge portions, said flange portions of a top edge portion and one side edge portion of each of said sheets of material having an inclined inner wall portion forming a wedge shape, said inclined inner wall portion having an opening in substantially close proximity to said wedge shaped portions for receiving a fastening member therethrough, said flange portions of a

bottom edge portion and the other side of said sheet of material having an inclined outer wall portion forming a mating slot substantially identical in shape and size with said wedge shaped flange portions, said simulated construction material of said sheets extending beyond said inclined outer wall portion, said simulated mortar line portion extending beyond said inclined inner wall portion and lying in a plane stepped inwardly of said simulated construction facing material,



whereby upon mounting said sheets of material on said wall, said wedge shaped flanges of one sheet are received by said mating slots of adjoining sheets of material, and fastening members extending through said openings for securing said sheets of material to said wall, and said extended simulated construction material extending over said fastening members whereby said inclined outer wall portion of one sheet engages said outer wall portion of an adjacent sheet in proximity of said fastening members.

3,968,611

DILATION JOINT STRIP

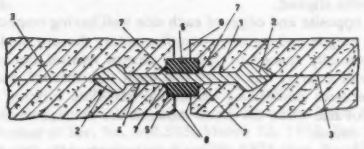
Eduard Herman Louis de Munck, The Hague, Netherlands, assignor to International B. F. Goodrich-Europe B.V., The Hague, Netherlands

Filed Sept. 9, 1974, Ser. No. 504,176

Claims priority, application Netherlands, Sept. 20, 1973, 7312973

Int. Cl.² E04B *1/62;* **E04F** *15/14*

U.S. Cl. 52—396 **3 Claims**



1. A dilation joint strip for sections of masonry defining a gap between the sections of masonry joined therewith and in which said sections of masonry have opposed recesses facing each other, said joint strip having a substantially flat intermediate portion and anchoring side wings integral therewith consisting of a solid material such as rubber, artificial rubber and other elastic deformable synthetic material, said anchoring wings being combined with further anchorage means for reliably anchoring said anchoring wings in the sections of masonry, said joint strip being provided at either side with a central strip of elastic cellular material extending in the longitudinal direction of said intermediate portion with opposite ends thereof in said opposed recesses and having a width greater than the width of the gap between said sections of masonry, said central strip covering said flat intermediate portion and also the end portions of the anchoring wings so that when said joint strip is in use, both end portions of said central strip are embedded in said recesses in said sections of masonry, said joint strip also including means for maintaining said central strips in place thereon.

3,968,612

MOTOR VEHICLE WINDOW

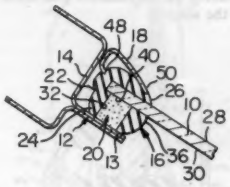
Shiro Endo, Hino; Minoru Yoshida, Hachiohji, and Kouichi Yaotani, Akikawa, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,012

Claims priority, application Japan, Feb. 9, 1974, 49-16448

Int. Cl.² E04B *1/62;* **E04C** *1/36*

U.S. Cl. 52—400 **4 Claims**



1. A motor vehicle window assembly comprising:

a windshield;

a window frame defining a windshield-receiving aperture;

said window frame having a flange in parallel spaced relationship to a marginal area on the rear surface of said windshield;

a looped trim strip of flexible plastic material including a channel portion having a front channel wall and a rear channel wall with an edge, a base portion spacing apart said front and rear channel walls such that said channel portion can embrace the edge of the windshield with said front channel wall lying against the front surface of said windshield and the rear channel wall lying against the rear surface of the windshield;

a dam portion spaced apart from the edge of said rear channel wall and a plurality of bridge portions integrally connecting it therewith such that said dam portion can lie against the rear surface of said windshield, said rear channel wall, the rear surface of said windshields and said dam portion cooperating to define an adhesive receiving channel;

an adhesive filling said adhesive receiving channel said adhesive bonding the rear surface of said windshield to said flange; and

said rear channel wall and said dam portion lying against said flange to prevent said adhesive from being exposed to the ambient atmosphere.

3,968,613

TRIM MOLDING ASSEMBLY

Engelbert A. Meyer, Union Lake, Mich., assignor to USM Corporation, Boston, Mass.

Filed June 3, 1974, Ser. No. 475,839

Int. Cl.² E04F *19/02;* **E04B** *1/62*

U.S. Cl. 52—400 **4 Claims**

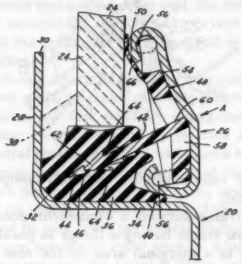
1. A trim molding assembly comprising a support having a window frame opening therein, a pane of glass or the like positioned to substantially cover said opening, an elongated trim molding extending generally along the lower marginal edge of said pane, a resilient pad interposed between the lower side of said window frame and said lower marginal edge of the pane, and a fastener interconnecting the molding and the pad;

said fastener including a body portion joined to the trim molding, and having a tongue-shaped extension projecting generally perpendicularly away from the molding;

said resilient pad having a slit opening through the face thereof adjacent to said trim molding, but terminating short of the opposite face of the pad, said slit having the opposite walls thereof spaced apart normally less than the thickness of said fastener extension but being expanded apart by the forced insertion of the extension therein;

said fastener extension being engaged within said slit, with the fastener extension and the slit having complementary, transversely extending surface portions interengaged with one another following insertion of the extension into the slit to prevent withdrawal of the fastener from the pad;

said pane resting upon said pad, and said slit extending into said pad in a direction generally transverse to the plane of said pane, whereby at least a part of the weight of the pane acts on the pad in the direction to close said slit and cause the opposing walls of the slit to apply contractual gripping pressures on the fastener extension to retain the same within the slit;



the upper marginal edge of said trim molding overlying said pane, and said fastener including a fin projecting from the body portion of the fastener and interposed between said pane and the upper marginal edge of said molding;

said resilient pad having an outwardly projecting foot-like portion underlying the lower marginal edge of said molding and interposed between the molding and the lower side of the window frame;

said trim molding being generally channel-shaped in cross-section and extending for approximately the lateral extent of the pane, and said resilient pad being fixed to said support in underlying supporting relation to the lower marginal edge of the glass pane and extending for approximately the lateral extent of the pane.

3,968,614

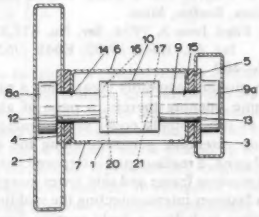
FRAMING

James Wallace, Sonning, England, assignor to Ideal Casements (Reading) Limited, England

Filed July 15, 1974, Ser. No. 488,848

Int. Cl.² E04C 3/30

U.S. Cl. 52—403 **8 Claims**



1. A framing member comprising three elongated tubular elements lying in parallel relationship, each such element having at least one plane surface adjacent a similar plane surface of another of the elements, resilient sealing strips located between each pair of adjacent plane surfaces, and transverse fasteners each securing all three said elements together, and located in at least two places along their lengths, the fasteners being adapted to exert pressure on the sealing strips.

3,968,615

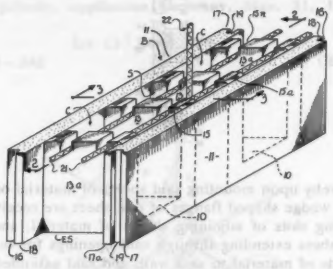
METHOD, BUILDING STRUCTURE AND BLOCK THEREFOR

George R. Ivany, 3871 W. Valley Drive, Fairview Park, Ohio 44126

Filed Aug. 15, 1975, Ser. No. 605,021

Int. Cl.² E04B 2/18

U.S. Cl. 52—439 **9 Claims**



1. A method for constructing a building wall comprising the steps of:

providing like three-cavity molded hollow rectangular block modules of cement-like material each comprised of a pair of like parallel vertical longitudinal side walls joined by pairs of like, flat-topped transverse webs.

the side walls having coplanar horizontal top edges, coplanar horizontal bottom edges, and at the respective ends of the block, coplanar principal end faces or edges, the tops of the webs extending above the side wall edges in projections beveled at opposite ends toward the side wall top edges, and the bottoms of the webs coplanar with the side wall bottom edges thereby to define a bed joint space between successive courses of block modules laid with webs aligned,

the opposite end edges of each side wal! having respectively a tongue and a groove complementary thereto, said webs mutually spaced to define a narrow central slot cavity, with a larger cell cavity one each side thereof, and end recesses comprising respective half-slots forming a full slot size when the block modules are abutted endwise in a course;

laying block modules, abutting endwise without application of head joint mortar to individual blocks in courses, upon bed joint mortar applied to the top edges of block modules in underlying courses, the block modules in each course staggered to bring the abutments over the central slots of block modules in the underlying course, thereby to form vertically elongated wall slots;

periodically among said courses including a distribution block course whereof:

the said block module have bottom walls in the cell cavities to form mortar receiving pockets, and the web tops have paired downward, horizontal reinforcing bar receiving notches, reaching to a depth sufficiently below the side wall top edges for said bars to be embedded by mortar filling said pockets;

after laying up to courses to a distribution course at story-height,

emplacing horizontal bars in the notches of the distribution course blocks and vertical reinforcing bars in some selected wall slots, and

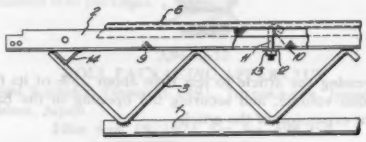
filling the mortar pockets of the distribution course blocks and the vertical wall slot.

3,968,616

DECKING BEAM ASSEMBLY

Peter Eric Gostling, Sutton Coldfield, England, assignor to C. Evans & Sons Limited, Ilford, United Kingdom

Filed Oct. 4, 1974, Ser. No. 511,950
Claims priority, application United Kingdom, Oct. 12, 1973, 47798/73
Int. Cl.² E04C 3/02
U.S. Cl. 52—645 6 Claims



1. A decking beam assembly for use in combination with support panels to provide shuttering for concrete structures, said beam assembly being adaptable for use with standard support panels of different sizes and comprising a lower stringer member, a pair of spaced-apart panel supporting upper members in the form of angle irons, connecting means in the form of zig-zag bars extending between, and fixedly secured to, said lower stringer member and respective ones of said panel supporting members, a plurality of spaced adjustable tie members extending between and connected to said two panel supporting members, a replaceable spacer element of generally T-shaped cross-section supported by said panel supporting members, said spacer element having a crossbar portion opposite ends of which are engaged by one edge of each of two adjacent ones of said support panels and a tail portion which is received between said two panel supporting members, and means for retaining said tail portion of said spacer element in position relative to said panel supporting members, the arrangement being such that said adjustable tie members permit a selected one of said replaceable spacer elements to be used depending on the size of said support panels.

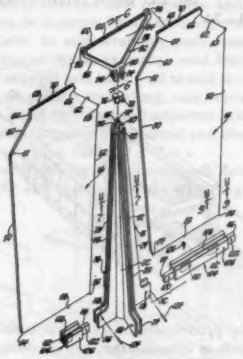
3,968,617

BUILDING STRUCTURE

John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220

Division of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application Nov. 20, 1974, Ser. No. 525,369
Int. Cl.² E04C 3/30; E04B 1/10
U.S. Cl. 52—720 7 Claims

1. A base member for laterally interconnecting succeeding structural column members, said base member comprising body means, said body means comprising a lower disposed mounting surface, an upper situated surface, first and second oppositely disposed side surfaces, first and second oppositely disposed end portions, slot means formed in said body means and through said upper situated surface, aperture means located generally between said first and second end portions and formed through said body means as to be directed generally transversely to said upper surface, said aperture means being effective to receive therethrough related anchoring means whereby said body means is secured to associated support structure supporting said body means along said lower disposed mounting surface, and first and second connecting portions generally respectively extending beyond said first and second end portions, said first and second connecting portions each having an uppermost surface at an elevation substantially below the elevation of said upper situated surface and being effective for operative connection to respective first and second of said succeeding structural column members as to



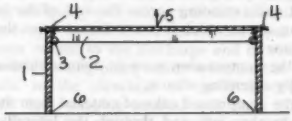
thereby be situated generally between said succeeding column members.

3,968,618

METHOD OF CONSTRUCTING A FOLDABLE BUILDING WITH BEAM ROOF AND RIGID FRAME

Delp W. Johnson, 240 Oakview Drive, San Carlos, Calif. 94070

Filed May 31, 1974, Ser. No. 474,937
Int. Cl.² E04B 1/00; E04G 21/14
U.S. Cl. 52—745 4 Claims



1. The method of constructing a clearspan building having an elongated Tee beam roof of given depth comprising the steps of:

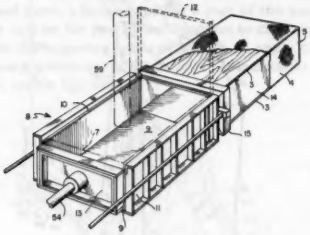
a. positioning said Tee beam and a further elongated structural member with major surfaces thereof in parallel planes and the axes of elongation thereof in alignment;
b. establishing a connection between said Tee beam and said further elongated structural member, which connection is pivoted about an axis normal to said axes of elongation thereof;
c. lifting said Tee beam by exerting a lifting force at a limited central portion only of said Tee beam to allow said further elongated structural member to rotate about said pivotal connection;
d. lowering the free end of said further elongated structural member into contact with a foundation; and
e. anchoring said Tee beam and said further elongated structural member to each other by means capable of withstanding both tensile and compressive stress at a point spaced from said pivotal connection by a distance at least about equal to one-half said given depth of said Tee beam and anchoring the free ends of said Tee beam and said further elongated structural member to said foundation whereby the release of said lifting force introduces bending moments into said Tee beam and said wall through said pivotal connection and anchoring means therebetween.

3,968,619

METHOD AND APPARATUS FOR PRODUCING ENCLOSED BALES OF COMPRESSIBLE MATERIAL

Francis B. Fishburne, P.O. Box 338, Arden, N.C. 28704

Filed Sept. 2, 1975, Ser. No. 609,673
Int. Cl.² B65B *13/20, 63/02*
U.S. Cl. 53—24 22 Claims



1. In the production of enclosed bales of compressible material such as tobacco, the method comprising

confining a predetermined quantity of the compressible material within an upright zone which terminates at the bottom in a compression zone in the form of a hexahedron which is similar to but slightly smaller than the bale to be formed and which can be placed in communication with a laterally extending sleeve having a transverse cross-sectional shape corresponding to that of the compression zone;

compressing the predetermined quantity of compressible material into the compression zone by forcing a press ram having a flat lower face downwardly through said upright zone until the flat face of the ram forms the top wall of the compression zone;

disposing about the laterally extending sleeve a container having an open end adjacent the compression zone and a closed end extending across the end of the laterally extending sleeve which is more distant from the compression zone;

placing the compression zone in communication with the laterally extending sleeve;

forcing the compressed cake of material from the compression chamber into and through the laterally extending sleeve;

maintaining the container on the sleeve until the compressed cake of material has reached the discharge end of the sleeve;

then positively moving the container over and away from the sleeve in the same direction and at essentially the same speed as the compressed cake is moved by said forcing step;

said steps of forcing the compressed cake and positively moving the container being continued until the cake has passed completely through the sleeve and the container has been removed from the sleeve; and

closing the open end of the container;

the compressed cake reexpanding, in the direction in which it was compressed, after the cake has emerged from the sleeve, such reexpansion causing the cake to place the container in tension.

3,968,620

METHOD OF COMPRESSING A FOAM ARTICLE

Heidi Keltner, 3389 Knollwood Court, Las Vegas, Nev. 89121

Filed Dec. 23, 1974, Ser. No. 535,798
Int. Cl.² B65B *63/02*
U.S. Cl. 53—24 1 Claim

1. A method of packaging an article fabricated from flexible foam encased in airpermeable fabric comprising encasing the article in a substantially air-tight bag, removing air from the bag by means of a vacuum pump to create a pressure differential between the inside and outside of the bag of at least 1.0 psi while simultaneously urging the bag into a rigid container,

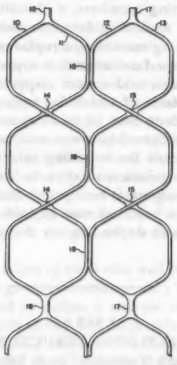
compressing the article to less than about 25% of its freely expanded volume, and securing the opening in the bag to prevent expansion of the article.

3,968,621

METHOD OF PACKAGING USING EXTRUDED NET

Ougljesa Jules Poupitch, La Jolla, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 250,535, March 5, 1972, and a continuation of Ser. No. 398,105, Sept. 17, 1973, abandoned.
This application Jan. 31, 1975, Ser. No. 545,964
Int. Cl.² B65B *5/08, 11/00;* B29F *3/00*
U.S. Cl. 53—52 8 Claims



1. A method of packaging including forming a multiple container carrier stock capable of being severed transversely at certain longitudinally spaced positions thereof to form successive individual multiple container carriers and applying said carriers to containers, said method comprising the steps of extruding a pair of strands of a resilient and deformable plastic material in a state subject to being fused together upon contact, moving said extruding strands together in a contiguous side-by-side relationship for a predetermined period of time to fuse said strands together in contiguous side-by-side portions thereof of such a length as is capable of being transversely severed to form common ends for successive carriers, thereafter moving said extruding strands apart and together and crossing in a repeating pattern and fusing said strands at intersections thereof to define a plurality of integral bands each having an inner circumferential dimension less than outer circumferential dimensions of containers intended to be associated therewith and sufficiently large to enable said bands to be stretched and circumferentially applied about said containers, thereafter repeating the step of moving said ex-

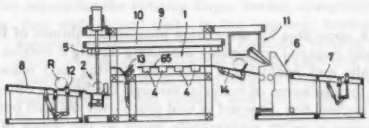
truding strands together in a contiguous side-by-side relationship for a predetermined period of time to fuse said strands together in a contiguous relationship of a predetermined length capable of being transversely severed to form the common ends of a pair of longitudinally adjacent individual multiple container carriers in said stock, and thereafter sequentially repeating the steps of forming said bands and said side-by-side portions to form said carrier stock as a longitudinal series of individual multiple container carriers interconnected by said side-by-side portions, and thereafter stretching and applying each of said bands circumferentially about a set of containers and contemporaneously transversely severing said strands intermediate said side-by-side portions thereby forming said containers into packages.

3,968,622

ROLL PACKAGING APPARATUS

Hiroshi Kataoka, Ohmachi 1491, Toyooka-cho, Iyomishima, Ehime, Japan

Filed Aug. 19, 1974, Ser. No. 498,369
Int. Cl.² B65B *57/14, 11/32*
U.S. Cl. 53—59 R **13 Claims**



1. A roll packaging apparatus comprising in combination, a substantially rectangular packaging table having means for effecting a packaging operation; a roll supplying device provided on one side of said packaging table; a packaging paper cutting and supplying device provided adjacent said packaging table; a transportation mechanism for positioning a cut packaging paper sheet from the supplying device in a desired position on said packaging table; a roll driving device for rollingly advancing a roll to be packaged on the paper sheet disposed on said packaging table from location of said table to another while rolling the paper sheet around the periphery of the roll to be packaged; said roll driving device comprises a vertically movable horizontal frame provided above said packaging table; endless belts provided below said horizontal frame to run along the advancing direction of the roll to be packaged and a driving means disposed to operate the endless belts; and receiving means provided adjacent an exit surface of said packaging table for receiving a roll having a paper sheet wrapped thereabout.

3,968,623

WRAP-AROUND CARTON FORMING MACHINE

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Feb. 26, 1975, Ser. No. 553,269
Int. Cl.² B65B *11/22, 41/08*
U.S. Cl. 53—195 **4 Claims**

1. In a wrap-around carton forming machine of the type having a carton wrapping station in which carton blanks are wrapped around forming mandrels which are driven continuously through a wrapping station in a wrapping path, the carton blanks each having a back wall panel and top and bottom wall panels each hingedly connected to the back wall panel, and a front wall panel, and a side closure flap hingedly connected to the top or bottom wall panels, and end flaps attached to said panels for closing the ends of the carton, the improvement of;

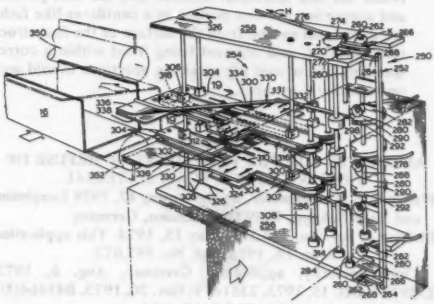
a. a storage magazine adapted to support a plurality of carton blanks in a vertically oriented face-to-face relationship, said magazine having a discharge end through which cartons may be removed one at a time from the magazine, said discharge end of said magazine being transversely spaced from said wrapping path, and

b. transfer means comprising

i. a frame,

ii. carton blank conveyor means mounted on said frame and extending between said magazine and said wrapping station in a carton blank shooting plane which is perpendicular to said wrapping path, said conveyor means being arranged to engage said back wall of a blank and support said back wall in said shooting plane during its movement therealong, said conveyor means having an input end disposed adjacent said discharge end of said magazine and an output end disposed adjacent said wrapping path,

iii. drive means for driving said conveyor to move a carton from the input end thereof into the wrapping path,



iv. dispenser means mounted on said frame and operable to remove carton blanks one at a time from said dispenser through said discharge end and to locate said carton blanks in said input end of said conveyor means,

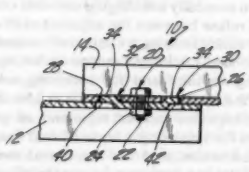
v. plow blade means mounted on said frame above and below said conveyor means, said plow blade means extending obliquely with respect to said shooting plane of said conveyor means from adjacent said input end of said conveyor means to the discharge end of said conveyor means in a folding plane which is inclined in a direction opposite to the direction of travel of the mandrels through the wrapping station, said plow blade means engaging said top and bottom wall panels of said carton so as to fold them along their hinged connection with said back wall, as said carton blank travels from said input end of said conveyor to the discharge end thereof, to a generally U-shaped configuration opening in a direction to receive a mandrel travelling along said wrapping path.

3,968,624

CONNECTOR FIXTURE

Jackson G. Allmendinger, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.

Filed July 1, 1975, Ser. No. 592,113
Int. Cl.² F16B *7/00*
U.S. Cl. 52—758 F **6 Claims**



1. A connector fixture comprising:

a first structural member having a central bore formed therethrough and a pair of lugs formed thereon, said lugs being formed on opposite sides of said central bore;

a second structural member having a central bore in register with said central bore of said first structural member and having a pair of lug receiving apertures formed therethrough which register with and receive said lugs of said first structural member therein; and

a connector inserted through said registering central bores of said first and second structural members clamping said first structural member to said second structural member, wherein each of said lugs comprises a segment having a generally-flat, thin, first portion generally parallel to the surface of the first structural member and having an exposed edge surface generally normal to the surface of the first structural member, and a second portion between the first structural member and the first portion and supporting the first portion in a centilever-like fashion above and spaced from the surface of the first structural member, said segment being fitted within a corresponding one of said lug receiving apertures in said second structural member.

3,968,625

APPARATUS FOR THE TREATMENT OF REFUSE OR THE LIKE WITH A FOAM MATERIAL

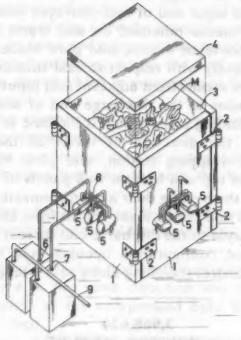
Walter E. G. Lindenmaier, Beethovenweg 47, 7958 Laupheim, and Hans Sukopp, 7959 Orsenhausen, Germany

Division of Ser. No. 470,278, May 15, 1974. This application Mar. 10, 1975, Ser. No. 557,072

Claims priority, application Germany, Aug. 6, 1973, 2339777; Oct. 15, 1973, 2351679; Nov. 20, 1973, B41464[U]

Int. Cl.² B65B *1/24*

U.S. Cl. 53—124 D **1 Claim**



1. An apparatus for the foam-treating of refuse or the like with a foam material of closed-cellular structure, comprising enclosure means for receiving a quantity of said refuse; means for compacting said refuse; said refuse compacting means comprising two conically converging movable conveyor bands receiving said refuse between the adjacent runs of said bands, said conveyor bands forming a continuous strand of said compacted refuse, said enclosure means including an elongate channel having an inlet end for receiving said compacted refuse strand; means adjacent said inlet end for separating said strand into compacted refuse segments of predetermined lengths; means for imparting a layer of said foam material to said compacted refuse, said last-mentioned means including foam material inlet nozzle means communicating with the interior of said channel intermediate the ends thereof for imparting an encompassing layer of foam material to each of said compacted refuse segments; and cutting means adjacent the outlet end of said channel for separating the foam material-enclosed segments between adjacent segments so as to form successive foam material-encased bodies.

3,968,626

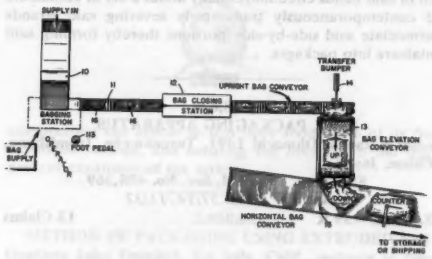
APPARATUS FOR BAGGING MATERIAL

Oliver K. Hobbs, Box 1306, Suffolk, Va. 23434

Filed Nov. 11, 1974, Ser. No. 522,761

Int. Cl.² B65B *1/00*

U.S. Cl. 53—267 **24 Claims**



1. An apparatus for dispensing measured volumes of flowable solid material comprising a housing having a bottom and end walls and enclosing a space for storing said material, means for discharge of material through the bottom comprising an endless belt disposed in said space over the said bottom and having a width substantially equal to the width of the space and extending longitudinally across the space from one end wall to a point spaced from an opposite end wall to provide space for flow of material over the end of the endless belt, an opening in said bottom for discharge of material flowing over the end of the endless belt, means for agitating material in the space and for limiting the thickness of material carried by said endless belt where the material flows therefrom, means for driving said belt with its upper reach travelling towards said discharge opening, means for initiating said driving means, and means for stopping the movement of the endless belt after it has travelled a predetermined distance.

3,968,627

TWIST FINGER DEVICE FOR A CANDY WRAPPING MACHINE

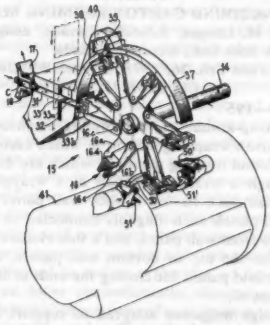
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Dec. 2, 1974, Ser. No. 528,663

Claims priority, application Italy, Dec. 20, 1973, 3545/73

Int. Cl.² B65B *7/12*

U.S. Cl. 53—370 **11 Claims**



1. Apparatus for twisting wrappers on products such as candies, comprising:

a twisting finger device having a carrier for transferring successive products each in a tubular wrapping having an end portion extending beyond the product from one to another part of a wrapping machine and for briefly stationarily presenting the end portion of each wrapper in a predetermined position during the transferring of the products, a housing in the machine opposite said position, a sleeve mounted in the housing for reversible axial sliding toward said position and having gear means on its circumference for driving it in continuous unidirectional rapid rotary motion, a pair of fingers each pivoted to and rotatable with an end portion of the sleeve outside the housing and adjacent said position for reversible pivotal movement of the fingers radially of the sleeve to releasably grip successive ones of the wrapper end portions and for twisting each gripped end portion as the fingers rotate with the sleeve, a rod mounted in the sleeve for rotation therewith and for axial reciprocable sliding both with and relative to the sleeve and having a rod portion projecting from the sleeve in the housing remotely from said position, the rod having another portion outside the housing and adjacent said position for effecting the pivotal movement of the fingers; and

drive means for the twisting finger device, comprising;

a. first and second disks in the housing, having hubs mounted respectively on and rotatable relative to the sleeve and the projecting rod portion, each disk having a web rigid with its hub and inclined to the sleeve and rod, defining a cam surface, and having gear teeth on the disk's circumference surrounding the cam surface;

b. first, second and third gear means unidirectionally rapidly rotatable in the housing in synchronism with one another, the first and second gear means engaging the gear teeth of the first and second disks, respectively and the third gear means engaging the gear means on the sleeve, for rapid rotation of the disks and sleeve respectively;

c. first and second roller means stationarily mounted in the housing in contact respectively with the cam surfaces of the first and second disks for axial shifting of the respective disks in response to the rotation thereof;

d. first shoulder means on the sleeve, engageable by the hub of the first disk for direct reversible shifting of the sleeve, fingers and rod, jointly, toward said position, by the first disk; and

e. second shoulder means on the projecting rod portion, engageable by the hub of the second disk for direct reversible shifting of the rod relative to the sleeve by the second disk to enable the pivotal movement of the fingers for gripping the wrapper end portions in synchronism with the rapid rotation of the sleeve and fingers for twisting the wrapper end portions.

3,968,628

TWIST FINGER APPARATUS FOR WRAPPING CANDIES AND THE LIKE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Dec. 2, 1974, Ser. No. 528,662

Claims priority, application Italy, Dec. 20, 1973, 3546/73

Int. Cl.² B65B 7/12

U.S. Cl. 53—370 **7 Claims**

1. A twist finger device, comprising;

a pair of fingers, each having a gripping member rigid therewith and disposed to be alternately (a) in a gripping position closely adjacent the gripping member of the other finger for gripping tubular wrap portions of candies and similar products between the gripping members to twist the gripped wrap portions and (b) in a releasing position spaced from the gripping member of the other finger, each finger also having an actuator member extending therefrom and rigid therewith;

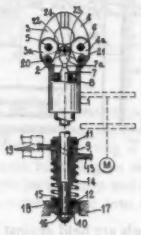
a pair of pivot pins, one for each finger, pivotally supporting the finger and located, parallel to one another between the gripping and actuator members of the finger;

a sleeve having an end portion supporting the pivot pins to support the fingers;

a rod slidably mounted in the sleeve for controlling the fingers and having an end portion which extends to a location adjacent the pivot pins;

means for rotation of the sleeve and rod;

a pair of links, each articulated at one point thereof to the end portion of the rod and at another point thereof to the actuator member of one of the fingers; and



means for reciprocatingly sliding the rod relative to the sleeve during their rotation for pivoting the fingers about the pivot pins by the links articulated to the rod and the actuator members, to alternately place the gripping members of the fingers in the gripping and releasing positions, an acute angle being defined, in a plane at right angles to the pivot pins, by (1) a line from the pivot pin of each finger to the point where the respective link is articulated to the finger's actuator member, and (2) a line from the latter point to the point where the respective link is articulated to the end portion of the rod, when the gripping members of the fingers are in the gripping position.

3,968,629

PACKAGING APPARATUS

Kenneth L. Gidewall, Clarendon Hills, and Larry W. Heavner, Glen Ellyn, both of Ill., assignors to CVP Systems, Inc., Lombard, Ill.

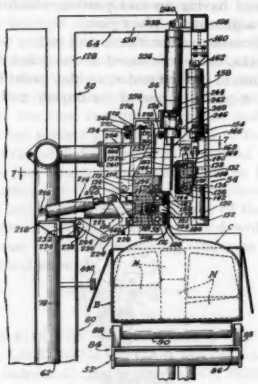
Division of Ser. No. 364,305, May 29, 1973. This application Mar. 4, 1975, Ser. No. 555,123

Int. Cl.² B65B 51/14

U.S. Cl. 53—373 **5 Claims**

1. A mechanism for gripping opposite sides of a flexible container, said mechanism comprising in combination, first and second elongated members, each of said members having cooperating facing surfaces, vacuum means communicating with said surfaces, means for moving said first elongated member between a first position at which said elongated members and said surfaces are laterally misaligned, and a second position at which said elongated members and surfaces are laterally aligned, said second elongated member gripping one side of said flexible container while said first elongated member is at said second position, means mounted on each of said elongated members for effecting a self-sustaining seal on said container sides, and means for moving said elongated mem-

bers between spaced and proximate relationships when said first elongated member is in said second position and while



said container panels are held against said elongated members by said vacuum means.

3,968,630

MOWER MACHINES

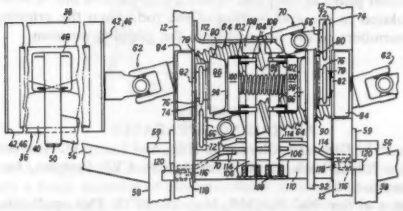
Brian Eric Mitchell, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed July 18, 1975, Ser. No. 597,373

Claims priority, application United Kingdom, July 29, 1974, 33419/74

Int. Cl.² A01D *75/30*

U.S. Cl. 56—7 **8 Claims**



1. A self-propelled grass mower machine comprising a chassis, ground-engaging wheels on which the chassis is supported, a cutter reel of the helically bladed type mounted on and, when in operative cutting position, extending laterally of and projecting from the chassis, a driving motor carried on the chassis for effecting propulsion of the machine and driving of the cutter reel, and transmission means for driving the cutter reel from the motor, wherein said transmission means include a driven member, a transversely disposed driven shaft and universal couplings connecting respective opposite ends of the driven shaft to the reel and, adjacent the side of the chassis remote from the reel, to said driven member of the transmission means, the axes of the shaft and the reel being mutually inclined at a large obtuse angle therebetween.

3,968,631

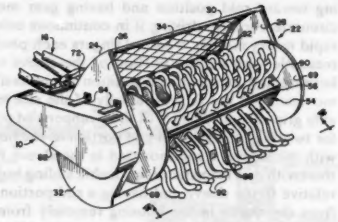
FRUIT PICKING DEVICE

Delmar C. Haines, Box 112, 401 N. State St., Saybrook, Ill. 61770

Filed Oct. 8, 1975, Ser. No. 620,699

Int. Cl.² A01D *46/00*

U.S. Cl. 56—328 R **13 Claims**



1. Apparatus for picking fruit from a tree comprising, a housing, an elongate drum mounted for rotative movement in the housing, the drum having a plurality of outer-facing generally planar surfaces, a first group of fruit engaging fingers disposed on each respective surface along a first line extending parallel to the elongate dimension of the drum, each pair of adjacent fingers of said first group defining a space therebetween, a second group of fruit engaging fingers disposed on each respective surface spaced from each other along a second line extending parallel to the elongate dimension of the drum spaced from said first line, adjacent ones of said first and second groups of fingers being staggered with respect to each other to provide a plurality of adjacent groups of three fingers along the length of the drum, each finger including a first generally straight portion extending normal from the drum and a second generally curved portion formed as an extension of the first portion, means for moving the housing adjacent the fruit on the tree and means for imparting rotative movement to the drum, whereby the fruit is engaged by a finger of said first group to move pivotally about the stem of the fruit to be wedged into said space and thereby is separated from the tree and deposited in the housing.

3,968,632

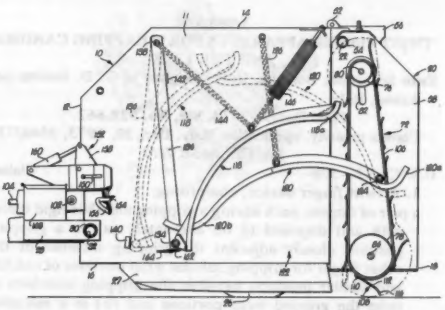
MACHINE FOR FORMING ROUND BALES

Melvin Victor Gaeddert, Newton, and Bobby Dwayne McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 2, 1974, Ser. No. 511,215

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 **29 Claims**



21. In a mobile round bale forming machine having a baling chamber:

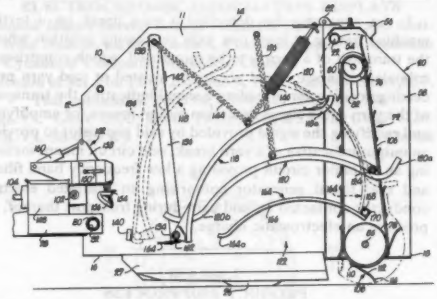
a rotary member carried in a position normally adjacent the ground and having an arcuate periphery;
an elongated, flexible element looped around said member and movable lengthwise during rotation of the member,
said element having a bale-engaging stretch extending across said chamber in disposition for engaging a bale forming in the chamber; and
a series of elongated crop lifting devices mounted on said element with their longitudinal axes extending at least substantially parallel to that of the element,
said devices being mounted to remain in said parallel relationship along said bale-engaging stretch but swing outwardly from said relationship as they move around said periphery of the member with the element.

3,968,633

ROUND BALE FORMING MACHINE FOR LIGHT CROP MATERIALS

Melvin Victor Gaeddert, Newton, and Bobby Dwayne McWhirt, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Continuation-in-part of Ser. No. 511,215, Oct. 2, 1974. This application Dec. 5, 1974, Ser. No. 529,739
Int. Cl.² A01D *75/00*
U.S. Cl. 56—341 **4 Claims**



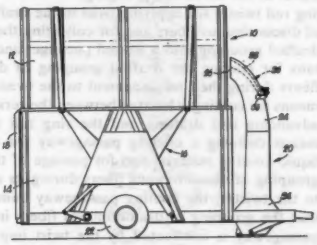
1. In a machine for forming round bales by rolling a mass of hay along a ground surface covered with loose hay:
a mobile, open bottom housing;
mechanism at the rear of said housing for picking up loose hay through said open bottom as the housing passes over the hay;
a pair of oppositely extending, upwardly concave, front and rear forming elements disposed in overlapping relationship to one another ahead of said mechanism and defining an arcuately topped, expandable forming chamber for the hay mass as the latter is rolled into a bale,
said rear element being upwardly and rearwardly swingable under resistance about an axis transverse to the normal path of travel of the housing to maintain yieldable pressure against the upper rear portion of the bale as it progressively grows in size,
said front element being mounted for upward and forward swinging under resistance about a transverse axis that is shiftable forwardly during growth of the bale to maintain yieldable pressure against the upper forward portion of the bale as it progressively grows in size; and
a second rear forming element in said chamber underlying the first mentioned rear element in vertically spaced relationship thereto for initiating rolling of the hay mass as the latter accumulates from said mechanism,
said second rear element being upwardly concave and being upwardly and rearwardly swingable under resistance independently of said first-mentioned rear element about a transverse axis below that of said first-mentioned rear element to confine and apply yieldable pressure against the mass alone until the latter swings the second rear element upwardly to said first-mentioned rear element.

3,968,634

STACK-FORMING MACHINE HAVING UNIFORM LOADING CONTROL

John Dale Anderson, Canton; Bruce Leo Lutz, Hesston, and Harold Keith Garrison, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Feb. 18, 1975, Ser. No. 550,177
Int. Cl.² A01D *87/10*
U.S. Cl. 56—344 **18 Claims**



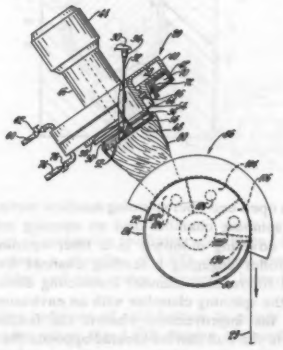
1. In a stack-forming machine having a hollow body provided with a reciprocable press and apparatus for picking up a crop from the ground and projecting it into the body for compaction, said apparatus including an elongate spout conducting a stream of the projected crop and having a discharge outlet oriented to direct the stream into the body, the improvement comprising:
elongate baffle structure;
means shiftably mounting said structure within said spout near said outlet for movement transversely of the spout along a predetermined path of travel,
said mounting means disposing each end of said structure within said stream; and
mechanism operably coupled with said structure for continuously oscillating the latter along said path and through said stream to reduce conglomerates of projected crop and to evenly distribute the stream from side-to-side within said body.

3,968,635

TEXTILE COATING APPARATUS AND METHOD

Charles R. Morrison, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 26, 1974, Ser. No. 527,312
Int. Cl.² D02G *3/18, 3/36, 3/40*
U.S. Cl. 57—35 **11 Claims**



1. Apparatus for forming a yarn from discontinuous glass

fibers that are effectively interengaged into a relatively loosely associated longitudinal sliver-like grouping comprising:

a container for holding the longitudinal sliver-like grouping of discontinuous fibers;

a series of rolls for linearly advancing the grouping of discontinuous fibers from the container and for drafting the grouping where the drafting places the interengaged discontinuous fibers in the sliver-like grouping into an orientation that is generally parallel to the direction of travel of the sliver-like grouping;

a ring rail twister for applying twist to the drafted grouping of discontinuous fibers and for collecting the twisted and drafted grouping into a wound package; and

means for coating the drafted grouping of discontinuous fibers during their advancement to the twister where the means for coating is located between the series of rolls for advancing and drafting and the ring rail twister, such means defining a coating passageway for containing a liquid coating material and for passage of the sliver-like grouping of discontinuous fibers during its advancement to the twister, the coating passageway being so located that the grouping of discontinuous fibers in the coating passageway is unaffected by the twist imparted by the twister during its advancement through the passageway so as to promote penetration of sizing material into the sliver-like grouping of discontinuous fibers.

3,968,636

OPEN-END FIBER SPINNING MACHINE

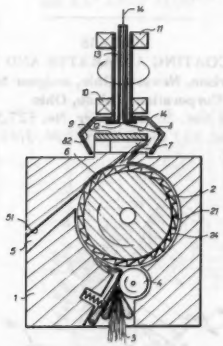
Jan Junek, Usti nad Orlici; Vaclav Vobornik, Lethohrad; Frantisek Jaros, Usti nad Orlici; Josef Ripka, Usti nad Orlici; Ludmila Lihtarova, Usti nad Orlici; Vladimir Ohlidal, Usti nad Orlici, and Frantisek Hortlik, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 22, 1974, Ser. No. 516,908

Claims priority, application Czechoslovakia, Oct. 24, 1973, 7309-73

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.95 **3 Claims**



1. In an open-end fiber spinning machine including an under pressure spinning chamber and an opening roller having a sawtooth covering mounted in a fiber opening body, said opening roller engaging a feeding channel for feeding the separated fibers, said channel connecting directly the inner space of the spinning chamber with an environment of higher pressure, the improvement wherein the feeding channel is provided in the wall thereof located opposite the fiber opening roller with a recess which is engaged by the sawtooth covering of the fiber opening roller, said covering being adapted to sweep adjacent the wall of said recess.

3,968,637

YARN BREAK DETECTION BY MEANS OF TRIBOELECTRICAL NOISE SIGNAL

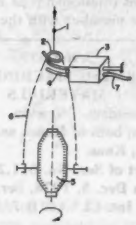
Eleonoor van Andel, Twekkelo; Garrit J. Hilferink, Arnhem, and Theodorus P. J. Lendering, Apeldoorn, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Aug. 5, 1974, Ser. No. 494,903

Claims priority, application Netherlands, Aug. 6, 1973, 7310809

Int. Cl.² D01H *13/16*

U.S. Cl. 57—81 **14 Claims**



1. An apparatus for detecting a yarn break on a textile machine having at least one yarn processing position where the transport of a yarn is to be monitored, which comprises a triboelectric noise signal generator located at said yarn processing position for providing a signal indicating the transport of the yarn and a signal detection circuit means for amplifying and rectifying the signal provided by said generator to provide an output indicative of a yarn break, said circuit means including an amplifier circuit providing a low frequency band filter, and said signal generator comprising an insulated electric conductor contacted by said yarn during transport thereof, to produce an electrostatic charge.

3,968,638

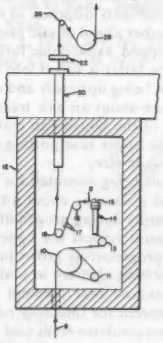
PRODUCT AND PROCESS

Lilburn Lafayette Norton, and William Thomas Windley, both of Seaford, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 9, 1975, Ser. No. 585,353

Int. Cl.² D02G *1/16, 1/20*; D02J *1/08*

U.S. Cl. 57—140 R **11 Claims**



1. A coherent yarn of continuous thermoplastic multifilaments which have an average of at least 4 crimps per inch of filament when relaxed in heat and moisture and are highly entangled throughout the length of the yarn, the yarn having

a lateral coherency of 0.2 to 2.8 inches with a standard deviation of less than 0.5 times the average value, and a latent twist of 0.75 to 10 turns per inch which is recoverable by relaxation of the yarn in heat and moisture, there being an increase in yarn bundle diameter of greater than 10 percent when recovering latent twist after tufting.

8. The process of preparing a coherent yarn from a feed yarn of continuous thermoplastic multifilaments which have an average of at least 4 crimps per inch of filament when relaxed in heat and moisture, which comprises feeding the feed yarn at an overfeed of 2 to 15 percent through a forwarding jet device wherein at least 3 jets of compressible fluid heated to a temperature which will plasticize the filaments are impinged laterally against the feed yarn from different directions to entangle the filaments throughout the length of the yarn, and forwarding the yarn from the entangling jets through a false-twist, heat-setting operation wherein the yarn is twisted to about 1 to 30 turns per inch by a false-twister, is heated and cooled while twisted to set latent twist in surface filaments of the yarn without removing entanglement from filaments inside the yarn bundle, and is then untwisted.

3,968,639

ELECTROCHROMIC INFORMATION DISPLAYS

Donald Joseph Berets; George Augustus Castellion, and Gottfried Haacke, all of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 149,423, June 3, 1971, Pat. No. 3,839,857. This application July 16, 1974, Ser. No. 489,796

Int. Cl.² G04C *3/00;* **G04B** *19/06;* **G01R** *27/22;* **G02F** *1/28*

U.S. Cl. 58—23 R **7 Claims**

1. An electronic device for visually indicating accumulated electric current flow comprising means to establish a regulated electric current flow, and a graduated persistent electrochromic display means electrically connected to said electric current flow means, whereby said electrochromic display changes color in a continuously advancing manner as a function of said current flow, so as to indicate accumulated electric current flow.

3,968,640

DIGITAL WATCH WITH ELASTOMER HOUSING BLOCK AND FLEXIBLE PRINTED CIRCUITRY

Paul J. Clemmer, Huntington Beach, and Roger A. Burke, Laguna Beach, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 16, 1974, Ser. No. 506,621

Int. Cl.² C04B *19/34*

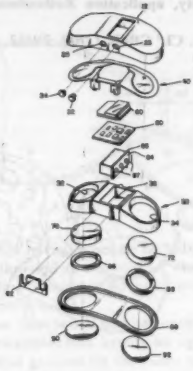
U.S. Cl. 58—50 R **5 Claims**

1. A digital watch having a case and a substrate on which electronic circuitry and electro-optical display devices are situated, a spacer block for supporting said substrate and for positioning and isolating at least one battery, the improvement comprising:

at least one push button for activating said display devices;

a flexible circuit with at least one contact for providing electrical continuity between said push buttons and said electronic circuitry and between said batteries and said electronic circuitry; and

an elastomeric spacer for supporting the substrate, isolating the batteries, and acting as a spring to return the contacts



of said flexible circuit to their uncontacted position after the push buttons have been depressed.

3,968,641

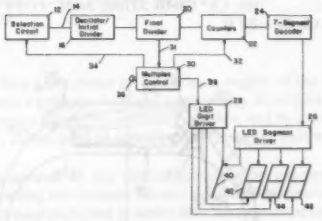
DIGITAL WATCH WITH OSCILLATOR/DIVIDER POWER SELECTION CIRCUITRY

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1975, Ser. No. 576,760

Int. Cl.² G04C *3/00;* **G04B** *19/30*

U.S. Cl. 58—50 R **7 Claims**



1. A method of increasing the battery life in an LED digital watch comprising a plurality of LED display elements, an oscillator divider and two series connected batteries, which comprises:

a. connecting only one of said battery to power the oscillator/divider when the LED display elements are not illuminated;

b. connecting said two series connected batteries to power the oscillator/divider when the LED display elements are illuminated.

3,968,642

WATCH-MOVEMENT FRAME WITH EXTRA HOLES FOR USING DIFFERENT ESCAPEMENT MECHANISMS

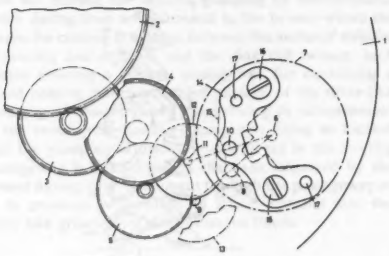
Hagues Bürki, L'Orient, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Jan. 21, 1975, Ser. No. 542,785

Claims priority, application Switzerland, Jan. 25, 1974, 1053/74

Int. Cl.² G04B *33/00, 29/02, 15/08*

U.S. Cl. 58—59 9 Claims



1. A watch-movement frame comprising a plate having holes for receiving bearings situated at the locations of gears of a wheel-train, of a pallet-lever, and of a balance, wherein two said holes are aligned in a first direction with respect to the location of said balance and are situated at respective distances from the axis of said balance corresponding to the dimensions of a first standard escapement centering, and another two said holes are aligned in a second direction with respect to the location of said balance and are situated at respective distances from the axis of said balance corresponding to the dimensions of a second standard escapement centering.

3,968,643

WRISTWATCH CASE AND WRISTLET ASSEMBLY

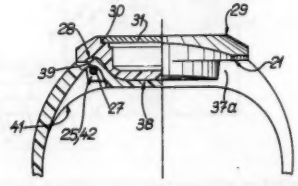
Marcel Curtil, 10, rue Marie-Louise, 25000 Besancon, France

Filed Mar. 25, 1975, Ser. No. 561,907

Claims priority, application Switzerland, Mar. 28, 1974, 4348/74

Int. Cl.² G04B *37/00;* A45C *11/10*

U.S. Cl. 58—88 R 6 Claims



1. A wristwatch comprising a case having a front face and a rear face;

said rear face of the case including a rearwardly-facing generally flat peripheral first shoulder and a back protruding rearwardly from said peripheral first shoulder, said back having two pairs of wristlet-securing horns extending from opposite sides of said back and disposed within the bounds of said peripheral first shoulder, each pair of horns having outer faces and facing inner faces;

a wristlet including a central case-receiving part having a front face and a rear face;

said front face of the central part of the wristlet having a complementary shape to said rear face of the case and including two spaced-apart second shoulders each adapted to bear against a part of said first shoulder of the case and each including a pair of lateral extremities shaped to fit about the outer faces of said pair of horns of the case, a middle portion inset from said second shoulders complementary to at least a part of the rear surface of said back of the case, and two bulges joining said second shoulders to said inset middle portion, each bulge extending from between the extremities of the respective second shoulder and being shaped to fit between a pair of horns of the case;

said rear face of the central part of the wristlet having recesses defined by said bulges and lateral openings through said bulges facing said extremities of said second shoulders for receiving wristlet-securing bars;

and wristlet-securing bars disposed in said recesses and having end parts removably securing the horns of the case between said extremities.

3,968,644

FUEL ADMITTING AND CONDITIONING MEANS ON COMBUSTION CHAMBERS FOR GAS TURBINE ENGINES

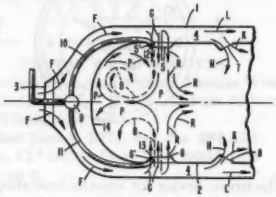
Adolf Fehler, Pfaffing, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Aug. 19, 1974, Ser. No. 498,662

Claims priority, application Germany, Aug. 18, 1973, 2341904

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.65 25 Claims



1. Combustion chamber apparatus for a gas turbine engine comprising:

an external engine casing,

a flame tube inserted in said engine casing such that an annular chamber is formed between the flame tube and the engine casing,

means for supplying primary combustion air and secondary mixing air to said annular chamber,

primary supply ports disposed at respective facing opposite sides of said flame tube for directing primary air from said annular chamber into said flame tube,

and fuel tubes projecting respectively into each of said primary supply ports for admitting fuel at low pressure and velocity for entrainment by portions of said primary air passing through said primary supply ports,

wherein said flame tube has an upstream end wall spaced upstream a small distance from said primary supply ports with respect to the flow of gases through said flame tube, wherein each of said primary supply ports are formed by wall means surrounding a primary port centerline of the respective primary supply port, each of said primary port centerlines extending in the direction of flow of primary air through the associated primary supply port toward the center of the flame tube, and wherein each of said fuel tubes terminate and open into said primary supply ports only at the side of said primary port centerlines closest to

the upstream end wall of said flame tube in such a manner that collision of primary air flow portions at the upstream sides of said supply ports from respective facing primary supply ports causes primary zone eddies to be formed recirculating approximately from the center of the flame tube toward said upstream end wall with said fuel from said fuel tubes being embedded in and mixed with the primary air portions in said primary zone eddies, and that the remaining portions of the primary air flow through said primary supply ports is deflected as mixing air in the region of the center of the flame tube which flows in the downstream direction of said flame tube.

3,968,645

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

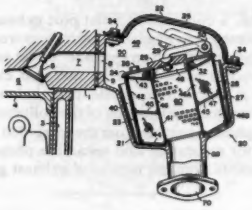
Masaaki Noguchi; Masaharu Sumiyoshi, and Shinichiro Mizusawa, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sept. 16, 1974, Ser. No. 506,450

Claims priority, application Japan, Oct. 12, 1973, 48-114499

Int. Cl.² F01N *3/14*

U.S. Cl. 60—288 **12 Claims**



1. An exhaust gas purifier for use in an internal combustion engine having a plurality of exhaust ports arranged horizontally relative to each other, said purifier comprising:

an exhaust manifold connected to said posts for collecting therein exhaust gases generated in said engine;

a catalyst container vertically installed in said exhaust manifold;

said container having inner and outer cylindrical walls and upper and bottom annular end walls, said inner and outer cylindrical walls having perforations thereon, an outer passage defined between said outer cylindrical wall and an inner wall of said exhaust manifold, an inner passage being defined by said inner cylindrical wall therein;

said exhaust manifold and said container being adapted to form a large space so that a thermal reaction of the exhaust gas takes place therein, said inner passage having a normally closed upper end;

catalyst charged to form a catalyst bed within a space defined by said inner and outer cylindrical walls and said upper and bottom end walls therebetween; and

an exhaust pipe connected to said container at a bottom opening of said inner passage for discharging exhaust gases to the atmosphere;

the arrangement being such that exhaust gases are introduced from said engine into said large space in which part of the unburned gases of the exhaust gases are burned in the presence of oxygen contained in the exhaust gases by the thermal reaction, and these gases flow through said outer passage and perforations disposed in said outer cylindrical wall into said catalyst bed where catalysis occurs, and thereafter through perforations disposed in said inner cylindrical wall and into said inner passage and then through said inner passage to be discharged through said exhaust pipe to the atmosphere.

3,968,646

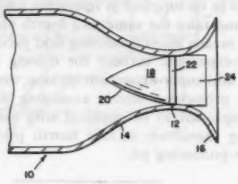
NOISE CONTROLLABLE NOZZLE CLOSURE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and Albert R. Maykut, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,035

Int. Cl.² F02K *1/00, 1/26*

U.S. Cl. 60—271 **1 Claim**



1. In a rocket motor having a nozzle including an entrance section, a throat section and an exit section, closure means for controlling the opening of said nozzle responsive to ignition of said rocket motor comprising:

a. a forward section disposed in said entrance section of said nozzle, said forward section having an ogival configuration having helical grooves on the outer surface thereof;

b. an intermediate section disposed in said throat section; and,

c. an aft section disposed in said exit section of said nozzle, said aft section having a solid frusto-conical configuration.

3,968,647

MULTIFLOW GAS TURBINE POWER PLANT

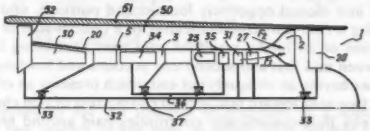
Serge Boudigues, Bagneux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 7, 1974, Ser. No. 467,793

Claims priority, application France, May 8, 1973, 73.16471

Int. Cl.² F02C *3/06*; F02K *3/04*

U.S. Cl. 60—262 **5 Claims**



1. A dual-flow gas-turbine jet propulsion engine of the kind subdivided into a primary duct and a secondary duct traversed in operation respectively by a primary gas flow and by a secondary air flow, comprising in combination (i) a fore unit which comprises:

a. a gas generator of the internal-combustion gas-turbine type including compressor means, combustion means and turbine means mounted in series flow arrangement in said primary duct, said gas generator being designed to deliver a gas flow at a first pressure, and

b. mechanical compression means extending in said secondary duct for compressing said secondary air flow to a second pressure lower than said first pressure; and (ii) an aft unit which comprises:

c. a super-expansion turbine separate and distinct from said turbine means and located in said primary duct downstream of said turbine means to receive the gas flow from said gas generator, said super-expansion turbine being designed to super-expand said gas flow from said first

pressure down to a third pressure substantially equal to said second pressure of said secondary air flow,

d. flow-mixer means communicating both with said primary duct downstream of said super-expansion turbine and with said secondary duct downstream of said mechanical compression means, for intermingling gas at said third pressure issuing from said super-expansion turbine with air at said second pressure issuing from said mechanical compression means, to deliver a gaseous mixture of said gas and said air,

e. a recompressor arranged downstream of said flow-mixer means to be supplied in operation with said gaseous mixture and raise the same to a fourth pressure,

f. drive means interconnecting said recompressor and said super-expansion turbine for driving said recompressor from said super-expansion turbine, and

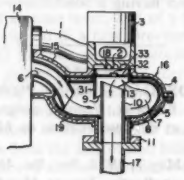
g. a jet propulsion nozzle extending downstream of said recompressor to be supplied with said gaseous mixture issuing therefrom at said fourth pressure, and issue a thrust-producing jet.

3,968,648

MANIFOLD REACTOR FOR AN AUTOMOBILE

Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 13, 1974, Ser. No. 532,468
Claims priority, application Japan, June 6, 1974, 49-63344
Int. Cl.² F02M *31/00*
U.S. Cl. 60—282 **5 Claims**



1. A manifold reactor for an automobile comprising a reactor vessel which defines a reaction chamber having at least first and second oppositely located end portions, said vessel having a riser port communicating to a bottom wall of a riser portion of an intake manifold, said riser port being located between said first and second end portions and bordered with a liner having an obliquely cut end which presents an effective end face area toward said second end portion of said chamber, thereby fluid-dynamically confronting said second end portion, exhaust gas inlet ports connected to exhaust ports of an engine and opening to said chamber at said first end portion, and an exhaust gas outlet port connected to an exhaust gas pipe and opening to said chamber within a region of said riser port.

3,968,649

EXHAUST EMISSION CONTROL SYSTEM

Thomas C. Edwards, Casselberry, Fla., assignor to The Rovac Corporation, Maitland, Fla.

Continuation-in-part of Ser. No. 417,888, Nov. 21, 1973, abandoned. This application Apr. 15, 1974, Ser. No. 460,700
Int. Cl.² B01D *50/00*
U.S. Cl. 60—297 **4 Claims**

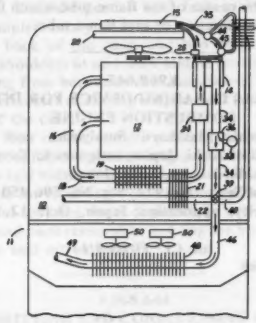
1. In an emission control system for treating the exhaust gas from an internal combustion engine of a moving vehicle, comprising, in combination:

means for initially cooling the exhaust gas from said engine,

means for adiabatically compressing said initially cooled exhaust gas,

means for cooling the adiabatically compressed exhaust gas, and means for work-expanding said cooled adiabatically compressed exhaust gas to further cool said exhaust gas,

the improvement wherein said adiabatically compressing means and said work-expanding means is a unitary rotary compressor-expander including a cylindrical rotor provided with a plurality of radially-extended vanes, said rotor rotating within a substantially elliptical stator having a compressor inlet port receiving said initially cooled



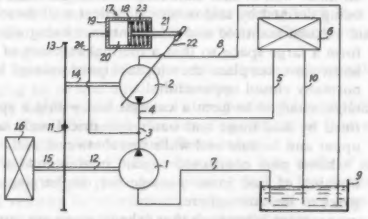
exhaust gas, a compressor outlet port exhausting to said cooling means, an expander inlet port receiving said cooled exhaust gas, and an expander outlet port discharging said cooled exhaust gas, so that said exhaust gas is cooled to a temperature substantially below ambient to condense a substantial portion of the pollutants as a liquid or a solid phase separable from the expanded exhaust gas, and means for separating said separable phase containing said pollutants from the expanded exhuast gas.

3,968,650

FLUID FEED DEVICE COMPRISING A CONSTANT CYLINDER CAPACITY PUMP AND AT LEAST ONE VARIABLE CYLINDER CAPACITY PUMP

Serge B. Bacquie, La-Croix-Saint-Quen, and Jean G. Dagnaux, Villers-Saint-Paul, both of France, assignors to Societe Anonyme: Poclain, Le-Plessis-Belleville, France

Filed May 2, 1975, Ser. No. 574,106
Claims priority, application France, May 15, 1974, 74.16902
Int. Cl.² F15B *11/16, 13/09*
U.S. Cl. 60—428 **6 Claims**



1. A device for feeding a load circuit with fluid under pressure through a pipe, comprising two pumps driven by one engine the maximum power of which is less than the sum of the maximum powers of the two pumps, one of the pumps being a constant cylinder-capacity pump and the other pump being a variable-cylinder-capacity pump provided with a regulator for regulating the value of its cylinder capacity, the said regulator comprising a jack having a movable member coupled to a member for regulation of the cylinder capacity of the

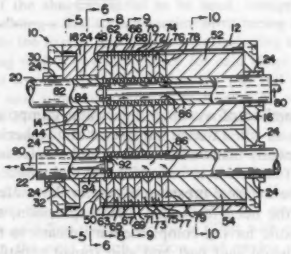
pump, a chamber connected to the pipe, and a resilient return member acting on the movable member in opposition to fluid pressure in the chamber and tending to displace the movable member in the direction of regulation of the cylinder capacity to its maximum value, the characteristics of initial tension and stiffness of the resilient return member being such that during regulation of the variable-cylinder-capacity pump by the regulator the power absorbed by the variable-cylinder-capacity pump is a decreasing linear function of the pressure, the power absorbed decreasing for a given increase in pressure by an amount to equal in absolute value the corresponding increase in the power absorbed by the constant-cylinder-capacity pump, so that the maximum power absorbed by the two pumps is constant and equal to the maximum power of the engine.

3,968,651

TRANS-CLUTCH TORQUE CONVERTER

Ralph Franklin Walworth, 226 13th Ave., NE., St. Petersburg, Fla. 33701

Filed July 2, 1975, Ser. No. 592,417
Int. Cl.[2] F16D *31/04*
U.S. Cl. 60—487 **10 Claims**



1. A trans-clutch torque converter comprising
a housing having two aligned chambers therein,
parallel input and output shafts journalled in the housing and extending through said chambers,
a driven gear pump in one chamber of the housing with the gears thereof individually mounted on said shafts,
a first pair of interengaging input gears positioned on said shafts in said second chamber with the gear on said input shaft being secured thereto,
a pair of interengaging output gears mounted on said shafts in said second chamber with the gear on said output shaft being secured thereto,
at least one pair of idler gears on said shafts between the other sets of gears thereon,
hydraulic fluid galleries being formed in both of said chambers, and
connecting means for transferring the liquid output of said gear pump to the input gallery of the second chamber for transfer to the output gallery of said second chamber by rotation of said first pair of gears in one direction and return to said input gallery by drive of said pair of output gears in the opposite direction.

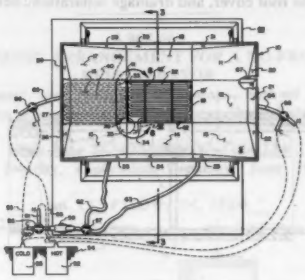
3,968,652

APPARATUS RESPONSIVE TO SOLAR ENERGY FOR PRODUCING POWER

Donald M. Chevalier, 248 15th Ave. S., Great Falls, Mont. 59405

Filed June 9, 1975, Ser. No. 585,126
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 **9 Claims**

1. A solar-powered, gas-turbine apparatus including, in combination, a screen having a central window; first and second heat-conductive hollow means for storing and releasing gas under pressure; a gas turbine interposed between and operatively communicating with said first and second means; track means mounting said first and second means for enabling the alternating disposition of one of said first and second means in registry position with said window; and an output drive coupled to said gas turbine.

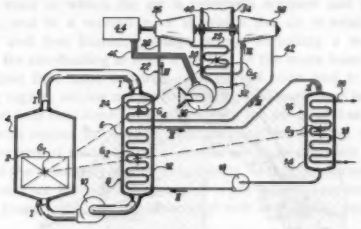


3,968,653

APPARATUS FOR THE REMOVAL OF AFTER HEAT IN A SODIUM-COOLED FAST REACTOR

Pierre Charles Cachera, Saint-Germain-en-Laye, France, assignor to Electricite de France (Service National), Paris, France

Filed Sept. 24, 1974, Ser. No. 508,855
Claims priority, application France, Oct. 2, 1973, 73.35223
Int. Cl.[2] E21D *3/04*; G21D *5/08*
U.S. Cl. 60—644 **9 Claims**



1. Apparatus for the removal of afterheat in a sodium-cooled fast reactor of the type in which each cooling loop comprises the primary sodium circuit which exchanges its heat with the sodium of a secondary circuit by means of an intermediate heat exchanger, wherein each cooling loop comprises in parallel with the secondary sodium circuit an auxiliary secondary circuit in which a chemically inert gas extracts heat from the primary sodium, said auxiliary secondary circuit being equipped with at least one gas turbine supplied with said inert gas and operating in a closed energy-producing gas cycle.

3,968,654

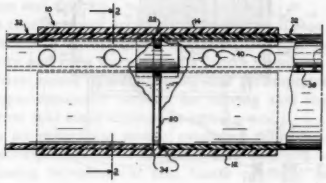
UNDERGROUND DRAIN PIPE COUPLING

Robert Sinbad Auriemma, R.D. No. 1, P.O. Box 104, Bethel, Pa. 19507

Filed Apr. 16, 1975, Ser. No. 568,398
Int. Cl.[2] E02B *11/00*
U.S. Cl. 61—11 **9 Claims**

1. An underground drainage pipe coupling formed of stiffly flexible material and including an elongate trough cover adapted to closely overlie the troughs of underground drain pipes joined by the coupling and having spaced lips, an elongate roof cover overlying the trough cover and adapted to

closely overlie the roofs of underground drain pipes joined by the coupling, means centrally located on the sides of the coupling joining the lip of the trough cover and the adjacent edge of the roof cover, and drainage separations between said



trough and roof covers to either side of said means, such separations permitting an unimpeded flow of water through water collection holes in the ends of the underground drain pipes joined by the coupling.

3,968,655

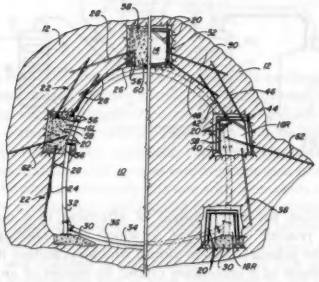
METHOD OF REINFORCING TUNNELS BEFORE EXCAVATION

William K. McGlothlin, 1040 48th Ave., Greeley, Colo. 80631

Continuation of Ser. No. 379,124, July 13, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,242

Int. Cl.² E01G *3/00*

U.S. Cl. 61—42 5 Claims



1. The method of reinforcing the perimeter rock bordering a tunnel formed through rock preparatory to excavating same which comprises the steps of: excavating a crown drift along the top of the proposed tunnel, excavating a pair of wall plate drifts along opposite sides of the proposed tunnel in spaced substantially parallel relation beneath and to the sides of the crown drift, drilling a longitudinally spaced series of small diameter bores downwardly and outwardly in both directions from within the crown drift along the ceiling of the proposed tunnel, drilling other series of similar bores upwardly from within the wall plate drifts along the walls of the proposed tunnel, inserting reinforcing rods into the bores of each series thereof a distance at least half way but less than all the way to the adjacent drift, said rods cooperating to define a metal curtain between drifts bordering the perimeter of the proposed tunnel, grouting the rods permanently in place within their respective bores, and filling the drifts with concrete.

3,968,656

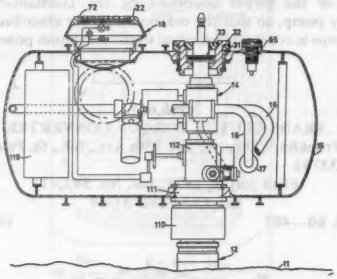
METHOD OF WORKING UNDERWATER

Kenneth Ball, Hightown, England, assignor to Intertek Technical Services Limited, Liverpool, England

Filed Apr. 1, 1974, Ser. No. 456,769

Int. Cl.² B63C *11/36*

U.S. Cl. 61–69 R 5 Claims



1. A method of working underwater comprising descending in an air-filled transit capsule at atmospheric pressure to a permanently installed part of an underwater installation on which a function is to be performed and which is at a depth where the external pressure is greater than safe for working without the need for lengthy decompression, said part and said capsule having complementary means to form another capsule when said part and said transit capsule are joined, joining the transit capsule in fluid-tight sealing relationship to said installation part so as to have two capsules, the transit capsule filled with air at atmospheric pressure and said another capsule filled with water initially at said external pressure, reducing the pressure of the water in said another capsule to atmospheric by connecting said another capsule to the atmospheric pressure in the transit capsule, gaining access to, and performing the desired function on, the installation part whilst it is surrounded with water at atmospheric pressure, returning to the transit capsule, repressurizing said another capsule by disconnecting it from the atmospheric pressure in said transit capsule while connecting said another capsule with sea water at said external pressure, and returning to the surface in said transit capsule.

3,968,657

METHOD FOR SETTING OR RESETTING POLES IN THE GROUND WITH FOAMED POLYURETHANE RESIN

Richard C. Hannay, 8111 Renmark, Houston, Tex. 77070

Filed July 19, 1974, Ser. No. 490,086

Int. Cl.² E02D *5/26*

U.S. Cl. 61—53.5 10 Claims

1. In the method of setting or resetting a pole or the like in earth with a foamed polyurethane composition which is formed in-situ by reacting organic polyisocyanate with an organic active hydrogen containing component reactive therewith; the improvement comprising utilizing polyurethane resin forming components including organic polyisocyanate and an organic active hydrogen containing material reactive therewith, said composition containing as an additional ingredient, a liquid water-immiscible component in an amount effective to allow formation of a foam of sufficient strength for holding the pole in the presence of water by inhibiting the reaction of the polyisocyanate with water.

3,968,658
METHOD AND APPARATUS FOR INTRODUCING WATER-PROOF SHEETING INTO THE GROUND IN A VERTICAL POSITION

Heiner I. Hammer, Klecken, Germany, assignor to Schlegel Engineering GmbH, Hamburg, Germany

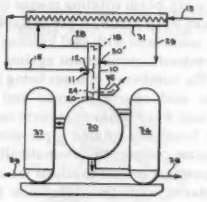
Filed Sept. 4, 1974, Ser. No. 502,953
Claims priority, application Germany, Sept. 12, 1973, 2345983
Int. Cl.² E02F *5/22*
U.S. Cl. 61—72.1 **6 Claims**

1. A method of introducing a horizontally elongated flexible sheet material, more particularly a waterproofing sheeting, in a vertical position into a trench by sequentially excavating a plurality of trench sections of short length in comparison to the length of the sheet material to be used, comprising the steps of excavating a first trench section introducing a protective liquid into the first of said trenches, introducing said sheet material along with a pay out device for said sheet material into said first trench section such that the pay out device is adjacent the next subsequent trench section to be excavated and a portion of said sheet material is vertically adjacent one wall of said trench, excavating the next trench section and placing the material excavated from the next trench into said first trench section as the excavated material is removed from the next trench section, allowing the protective liquid to be displaced from the first trench section into the next trench section as the said first trench section is filled with excavated material from the next trench section, and paying out sheet material into the next trench section.

3,968,659
PROCESS FOR SEPARATING WATER AND LIQUID HYDROCARBONS FROM A FLUID FLOW MEDIUM

David W. Pilcher, 2544 Aspen, Pampa, Tex. 79605

Filed Sept. 9, 1974, Ser. No. 504,271
Int. Cl.² F25B *9/02*
U.S. Cl. 62—5 **10 Claims**

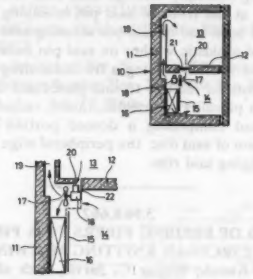


1. A method of treating a fluid flow having entrained liquids comprising the steps of:
   a. conducting the fluid flow through a heat exchanger in a single pass;
   b. conducting the fluid flow from the heat exchanger to a vortex generation chamber in a housing in a single pass to split the fluid flow into a hot stream and a cold stream;
   c. conducting one of the streams to the heat exchanger in a single pass for heat transfer relationship between the stream and the fluid flow;
   d. conducting the cold stream to a vessel to condense and separate the entrained liquids therefrom in a single pass; and
   e. discharging the resulting cold stream from the vessel.

3,968,660
COOLING ARRANGEMENT FOR A NO-FROST REFRIGERATOR

Klaus Amann, and Wolfgang Dienemann, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Munich, Germany

Filed June 28, 1974, Ser. No. 484,334
Claims priority, application Germany, June 29, 1973, 2333158
Int. Cl.² F25D *21/04, 17/06*
U.S. Cl. 62—275 **7 Claims**

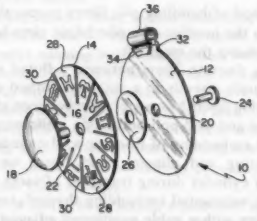


1. A cooling arrangement, particularly for a no-frost refrigerator, comprising a heat-insulating housing containing air in a first zone in which the air is relatively warmer and more humid, and in a second zone in which the air is relatively cooler and less humid; passage means including a mixing region for conducting at least a portion of the more humid air from said first zone towards said second zone and to said mixing region; mixing means for causing said portion of humid air from said first zone to be mixed with the air in said second zone; and means for heating and lowering the relative moisture content of said portion of humid air from said first zone prior to the mixing by said mixing means, so that the formation of fog and ice in said mixing region is prevented, said heating means comprising a motor associated with said mixing means.

3,968,661
JEWELRY HAVING ROTATABLE INDICIA-BEARING DISC AND INDICATING MEANS

Francis E. Williams, North Scituate, R.I., assignor to Carl-Art, Inc., Providence, R.I.

Filed Sept. 23, 1974, Ser. No. 508,268
Int. Cl.² A44C *25/00*
U.S. Cl. 63—31 **1 Claim**



1. An ornamental article adapted to be worn on the person, comprising a flat, rigid, generally circular back plate, a generally circular front disc rotatably mounted on said back plate, means on the front surface of said disc defining a plurality of

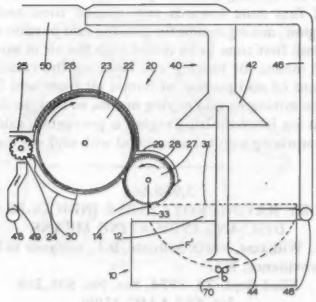
substantially equal sections located adjacent the outer periphery of said disc, each section having a different form of ornamentation provided therein, and indicating means fixedly carried by said back plate and having a portion located adjacent the periphery of said disc, said portion corresponding generally to the outer peripheral width of said sections, whereby said disc may be manually rotated until a desired section is in alignment with said indicating means, said indicating means comprising a reversely bent, integral extension of said back plate, and means fixedly secured to the top of said indicating means for receiving a neck chain or the like, whereby when said article is suspended during normal use, said indicating means will automatically be located at the top of said article, said receiving means comprising an elongated tube extending laterally across the top of said indicating means and substantially co-extensive therewith, the means for rotatably mounting said disc on said back plate comprising a pin extending centrally through said disc and plate, an enlarged head at the front of said pin overlying said disc and means at the back end of said pin securing said disc and plate together, and a plastic washer on said pin between said plate and disc, said washer causing a frictional drag to exist when said disc is rotated relative to said plate, said defining means comprising a plurality of integral, raised, radial ribs, and said enlarged head comprising a domed portion overlying the central portion of said disc, the peripheral edge of said domed portion engaging said ribs.

3,968,662

METHOD OF FEEDING FIBERS TO A PILE FABRIC CIRCULAR KNITTING MACHINE

Anthony F. Kunak; Wayne C. Jarvis, both of Spartanburg, S.C.; Rollie B. Kidd, and Bobby L. Williams, both of Morganton, N.C., assignors to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,410
Int. Cl.[2] D04B *9/14;* **D01G** *15/24*
U.S. Cl. 66—9 B **4 Claims**



1. A method of handling pile fibers preparatory to feeding the fibers to the needles of a pile fabric circular knitting machine comprising the steps of:

a. feeding discrete fibers between a fluted roll and a polished guide directly to a rotating clothed cylinder;

b. separating fibers by cooperation between clothing on said cylinder and said polished guide while avoiding any substantial embedding of fibers in said cylinder clothing;

c. separating and aligning said fibers on said rotating clothed cylinder during transport of same while precluding any substantial embedding thereof, said cylinder cooperating with a guide positioned adjacent thereto;

d. contacting only said fibers being carried on said clothed cylinder with fiber engaging elements rotating in a direction opposite the direction of rotation of said clothed cylinder and removing said fibers from said cylinder for transfer to the needles of the knitting machine, said fibers having passed through a closed system in transit from the fluted roll and polished guide through the means for removing the fibers from the rotating clothed cylinder; and

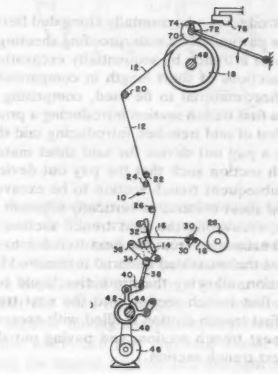
e. generating an air current through said closed system at least in part externally of the closed system, whereby said fibers float atop said cylinder clothing without any substantial embedding thereof.

3,968,663

KNITTING MACHINE TENSION CONTROL

Charles Ray Masters, Walhalla, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 30, 1974, Ser. No. 510,436
Int. Cl.[2] D04B *23/00, 27/00*
U.S. Cl. 66—212 **4 Claims**



3. An improved warp knitting machine comprising: a warp beam having warp yarn thereon, a plurality of knitting needle means supplying yarn from said warp beam to said plurality of needles, means rotating said warp beam at pre-determined speed to deliver warp yarns to said knitting needles, means actuating said knitting needles to knit said warp yarn into knit fabric, means to take-up the knit fabric, means operably associated with said warp beam rotating means to adjust the speed of rotation of said warp beam, a pre-settable course counter means operably associated with said knitting machine to compare a pre-determined course count against an actual course, means to count the number of courses being knit and to supply such number to said course counter and means operably associated with said warp beam to actuate said course counter when said warp beam has rotated a pre-determined distance to cause said course counter to automatically cause said warp beam speed adjustment means to adjust the speed of said warp beam in accordance with the difference between the pre-determined pre-set course count and the actual course count.

3,968,664

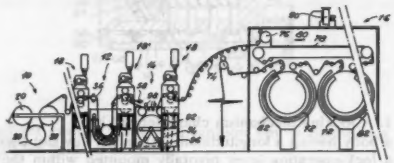
APPARATUS FOR FINAL IMMERSION WASHING OF FABRICS

Amedea Arioli, and Lorenza Arioli, both of Via Cristoforo Colombo 20, 21040 Gerenzano, Italy

Filed July 25, 1974, Ser. No. 491,868
Claims priority, application Italy, July 27, 1973, 27195/73
Int. Cl.[2] D06F *29/00, 35/00, 3/00*
U.S. Cl. 68—22 R **11 Claims**

1. In an apparatus for the continuous immersion washing of an uninterrupted length of fabric tending to curl when subject

to longitudinal pull, a combination comprising a plurality of washing stations including at least one washing container adapted to contain washing liquid at a predetermined level; a rotary member adapted to be partially immersed in the washing liquid and mounted for rotation about a horizontal axis; drive means for intermittently rotating said rotary member about said axis, said drive means including a pair of gears connected to opposite axial ends of said rotary member and a pair of endless elongated sprocket chains trained about said gears; a plurality of radially extending first vanes distributed about said rotary member; a plurality of second vanes extending transversely of and distributed along the elongation of said chains in a predetermined spacing and phase relationship, successive ones of said second vanes being respectively



aligned in coplanar positions with successive ones of said first vanes in end-to-end relationship so as to form during rotation of said rotary member, at least in a region immediately above and below said predetermined level, substantially horizontal platforms upon which the fabric is deposited, adjacent pairs of said first and said second vanes forming essentially closed spaces when said rotary member moves through the washing liquid, and the fabric being maintained and carried essentially entirely between said adjacent pairs of vanes in said closed spaces in an essentially tensionless condition; and reciprocating means for feeding successive portions of the fabric intermediate said rotary member and said chains so as to deposit and fold the successive portions of the fabric overlapping relationship onto respective ones of said platforms formed above said predetermined level of the liquid.

3,968,665

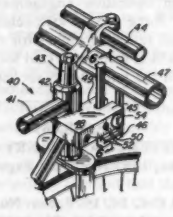
SLOTTED LOCKING DEVICE

Edward A. Kaufmann, 2785 N. Speer Blvd., Denver, Colo. 80211

Continuation-in-part of Ser. No. 393,828, Sept. 4, 1973, Pat. No. 3,832,871, which is a continuation-in-part of Ser. No. 349,489, April 19, 1973, Pat. No. 3,841,119. This application Aug. 23, 1974, Ser. No. 500,107

Int. Cl.[2] B62H *3/02, 5/00;* E05B *71/00*

U.S. Cl. 70—234 **3 Claims**



1. A bicycle locking device for securing a bicycle to an anchored elongated object, comprising:

a. a body including a U-shaped clamp means positioned around the frame of a bicycle with the ends of said clamp firmly secured in said body, and having a pair of outwardly extending, rigid arms spaced from each other to form an open slot therebetween, said spaced arms include aligned transverse apertures arranged near the outer end of said arms, said body being fixedly attached to the frame of said bicycle;

b. at least partially removable axial locking means arranged to be inserted into said apertures for releasably enclosing said anchored object between said spaced rigid arms, whereby said bicycle can be secured to prevent unauthorized removal; and

c. said axial locking means includes a lockable cylinder and an extension member mounted at one end of said cylinder and an extension whereby when the locking means is inserted into said apertures, the extension member is disposed across the opening between said arms to prevent removal of the bicycle from said anchored object.

3,968,666

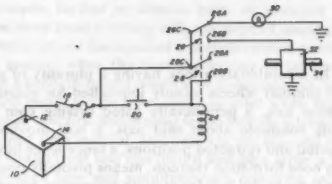
AUTO ANTI-THEFT DEVICE

Richard B. MacKinnon, Oakland Heights Bldg., Apt. 12, Exeter, N.H. 03833

Continuation-in-part of Ser. No. 370,358, June 15, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,095

Int. Cl. B60r *25/04*

U.S. Cl. 70—243 **13 Claims**



1. An anti-theft circuit for a vehicle having an ignition switch receiving energy from a battery and a fuel line for delivering the fuel to the engine of the vehicle, said circuit operable by an authorized operator to permit operation of the vehicle and comprising;

electromechanical relay means,

a switch means disposed in the vehicle in a position known by an authorized operator but not known by an unauthorized operator,

conductor means coupling said switch means in a series circuit with said ignition switch and electromechanical relay means,

an electrically-operated valve means disposed in the vehicle fuel line and having an open position and a closed position,

and an indicator means,

said electromechanical relay means including two sets of contacts at least one of which is responsive to an authorized operator causing both said ignition switch and said switch means to be in a closed position to couple energy to said relay means, for operating said valve means to its open position thereby permitting fuel flow through said valve means, and responsive to an unauthorized operator not closing said switch means to maintain said valve means in its closed position thereby preventing fuel flow through said valve means,

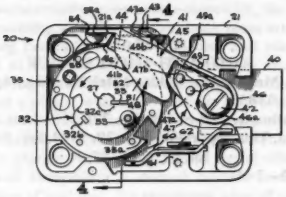
each said set of contacts including a common terminal and a pair of selective terminals with the indicator means coupling to one selective terminal of the one set and the valve means coupling to the other selective terminal of the one set whereby the indicating means is adapted to be in its indicating condition when said valve means is closed.

3,968,667

COMBINATION LOCK CONSTRUCTION

Klaus W. Gartner, Downey; Tim M. Uyeda, San Gabriel, both of Calif., and Steven Helesfai, Rochester, N.Y., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed July 2, 1975, Ser. No. 592,671
Int. Cl.² E05B 37/08
U.S. Cl. 70—303 A 17 Claims



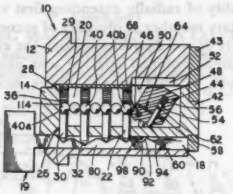
1. In a combination lock having a plurality of peripherally gated tumbler wheels loosely journalled for rotation about a common axis, a peripherally gated driving cam fixed on a spindle rotatable about said axis, a bolt movable between projected and retracted positions, a fence lever having a fence and a nose formation thereon, means pivotally connecting the fence lever to the bolt for arcuate movement between a raised inactive position spacing the fence and nose out of contact with the tumbler wheel and driving cam peripheries and a lowered active position locating the fence and nose in said gates, the driving cam being operatively coupled to said nose at said active position for retracting the bolt upon rotation of the driving cam, means providing a lost motion driving coupling between the driving cam and tumbler wheels for adjusting the angular positions of the tumbler wheels, and a rotatable dial on the spindle for rotating the driving cam to angularly adjust the tumbler wheels, and improvement comprising over-center spring means coupled to said fence lever normally positioned for holding the latter at said raised inactive position, a fence lever accelerator including an anvil surface portion and a hammer portion mounted on the fence lever with the hammer portion supported by a spring formation for relative movement between a stressed spring energy storage position spaced from said anvil surface portion and an impact position engaging the latter, the accelerator having an abutment formation extending into the path of movement of a portion of the driving cam providing means for shifting said hammer portion to the stressed position upon selective rotation of the driving cam, restraint means for releasably supporting said hammer portion at said stressed position, and means for releasing said hammer portion from such stressed position for rapid spring driven movement to impact against said anvil surface portion and impel the fence lever toward the driving cam to a position momentarily engaging the fence with the tumbler wheel peripheries, the over-center spring means being operative to continue urging the fence lever to said raised inactive position when the tumbler wheel gates are not aligned with the fence to immediately return the fence lever to said raised inactive position following the momentary engagement with a misaligned tumbler wheel periphery and the over-center spring means shifting to a position urging the fence lever to said lowered active position responsive to such impelling of the fence lever toward the driving cam when the tumblers are properly aligned therewith.

3,968,668

PICKPROOF CYLINDER LOCK

Norman Epstein, Carmel, N.Y., assignor to Norman Lock Co., Mahopac, N.Y.

Continuation-in-part of Ser. No. 388,428, Aug. 15, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,034
Int. Cl.² E05B 17/04
U.S. Cl. 70—364 A 9 Claims



1. A locking mechanism characterized by:
a body having a longitudinally-extending key slot therein;
a lock-operating lever pivotally mounted within the lock body for movement between a normal locking position and a second position which it must occupy before the lock can be released;
biasing means urging said lock-operating lever to its normal locking position;
a key sized for insertion into said key slot and movable to a fully-inserted position therein;
a plurality of key-actuatable members movably mounted within said body;
means urging said key-actuatable members toward positions in which portions thereof are engageable by said key when inserted in said key slot, and from which positions said key-actuatable members are movable to predetermined unlocking positions by said key in its fully inserted position;
a lock-release element carried by each of said key-actuatable members, said key-actuatable members having a normal lock-closed position in which said lock-release elements are maintained out of operative association with each other, said key-actuatable members in their unlocking positions retaining said lock-release elements in operative engagement with each other, with each element exerting a force upon the adjacent elements and said force being transmitted to said lock operating lever in a direction to move the latter to said second position;
releasable retaining means for rigidly locking said lock-operating lever in its normal locking position against movement to its second position, said retaining means being engageable by said lock-release elements when the latter are in operative engagement with each other, whereby the force of said lock-release elements is transmitted to said retaining means for moving the latter to a position in which it releases said lock-operating lever for movement of the latter to its second position.

3,968,669

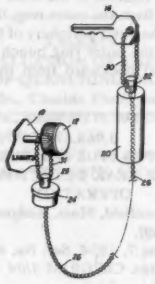
BATTERY SAVING KEY CHAIN

Berta W. Coleman, 1447 Northeast Expressway, NE., Atlanta, Ga. 30329

Filed Oct. 14, 1975, Ser. No. 621,658
Int. Cl.² A47G 29/10
U.S. Cl. 70—456 R 6 Claims

1. A battery saving key chain for inhibiting unintentional usage of an automobile battery comprising a capsule having a tubular member with an open end and a cap member dimensioned to removably close said tubular member open end and thereby define a storage space within said tubular member, a flexible elongated connecting member sized for storage within said storage space loosely connecting said cap member with said tubular member; means for linking an automobile ignition

key with one of said capsule members and means for suspending the other of said capsule members from an automobile

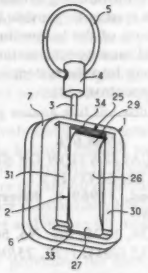


headlight control while said ignition key is operatively engaged for ignition purposes.

3,968,670
SECURITY KEY-RING

Michel Quenot, Besancon, France, assignor to Stanley-Mabo, Besancon, France

Filed Jan. 20, 1975, Ser. No. 542,441
Claims priority, application France, Feb. 2, 1974, 74.04209
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **7 Claims**

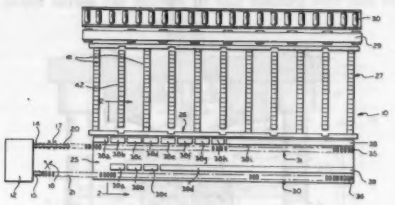


1. Safety key-rings for use by prison guards, formed of two half-shells, male and female, fitting one into the other, containing in their free inside an automatic roll-up mechanism with a strong pull-back spring to the rolled-up position, the mentioned mechanism pulling with it a solid string over the upper edge of the housing, which is inseparably connected with a key-ring, characterized by the fact that the rear face of the housing has a metal attaching assembly in the shape of a clasp to hold it onto an outside plane, which clasp is safely anchored to its frame on the half-shells forming the housing, and further characterized by the fact that the metal attaching device is essentially composed by the clasp, with double purpose, containing a central blade in the shape of an elongated S, presenting a lower loop with its concave side turned toward the housing, a central part, which is practically flat, of considerable length, and a free upper part, curved in, its concave side turned toward the outside, to take up the blade, and by the fact that this blade holds onto a frame constituted by two narrow iron plates, placed longitudinally, between which is placed the blade, the flat irons being connected to each other by the cross pieces, one top the other bottom, perpendicularly to the plane of the mentioned flat irons.

3,968,671
COOLING BED METHOD

John F. Turner, West Lawn, Pa., assignor to Birdsboro Corporation, Birdsboro, Pa.

Division of Ser. No. 468,373, May 9, 1974, Pat. No. 3,916,660.
This application Aug. 27, 1975, Ser. No. 608,038
Int. Cl.² B21B *37/00, 43/00, 45/02*
U.S. Cl. 72—14 **6 Claims**

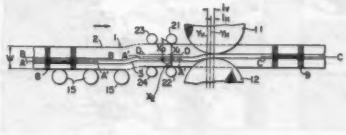


1. A method of simultaneously transferring pairs of elongate metal strands from pairs of inlets of a cooling bed, which metal strands precede further successive pairs of elongate metal strands, received from a rolling mill, the steps of sensing when said first metal strand has reached a predetermined position in one inlet, sensing when the next succeeding metal strand is received at a predetermined position of a second inlet, removing said first metal strand from said one inlet when the time lapse between said first and second metal strands is larger than a predermined time interval, and delaying the removal of said first metal strand from said one inlet if said time lapse is below a predetermined time and simultaneously removing said two metal strands from both of said inlets.

3,968,672
METHOD OF ROLLING SHAPED STEEL MEMBERS HAVING FLANGES AND APPARATUS THEREFOR

Yoshiro Kamogawa, and Akihiro Saoka, both of Sakai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 3, 1974, Ser. No. 529,107
Claims priority, application Japan, Dec. 5, 1973, 48-135965
Int. Cl.² B21B *1/08*
U.S. Cl. 72—225 **11 Claims**

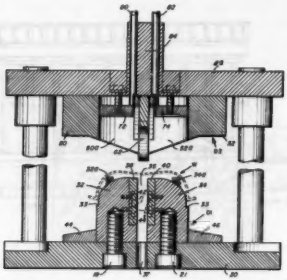


1. In a method of rolling shaped steel members having flanges and a web by a universal rolling mill having horizontal and vertical working rolls, the improvement which comprises engaging the shaped steel member at least along the tops and bottoms of the flanges at a point immediately ahead of the universal rolling mill with a force sufficient only for guiding the material to be rolled so that the center of the width of the flanges is substantially level with the pass line of said universal rolling mill before the material of the steel member being rolled is bitten into by the working rolls of said universal rolling mill, and causing the vertical rolls of the universal rolling mill to contact the flanges of said material to be rolled no later than the horizontal rolls contact the web of said material to be rolled.

3,968,673
METHOD AND APPARATUS FOR PRODUCING STEEL BOX TOES TO BE USED IN SAFETY SHOES

William H. Ryan, Boca Raton, Fla., and Norman H. Evers, West Natick, Mass., assignors to William H. Ryan, Boca Raton, Fla.

Filed Apr. 25, 1975, Ser. No. 571,624
Int. Cl.² B21D *28/06, 31/00*
U.S. Cl. 72—331 20 Claims

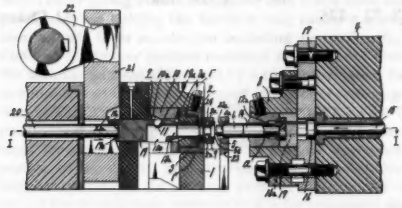


1. In a method of making box toes for safety shoes in which a metal sheet material is subjected to pressure to produce a bowl-shaped workpiece having a pair of mirror-imaged toe cap parts surrounded by irregular outer edge portions, the steps which include cutting the workpiece to provide separated toe cap parts, and then trimming said out edge portions from the toe cap portions as they become separated from one another by progressively exerting shearing forces thereareound.

3,968,674
APPARATUS FOR SIMULTANEOUSLY PRODUCING INNER AND OUTER RINGS IN HOT FORMER

Tomio Ishida, Toyonaka, Japan, assignor to Sakamura Machine Co., Ltd., Osaka-Shi, Japan

Filed Aug. 5, 1975, Ser. No. 602,007
Claims priority, application Japan, Aug. 6, 1974, 49-90539
Int. Cl.² B21D *28/06, 45/04*
U.S. Cl. 72—334 5 Claims

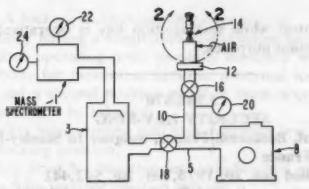


1. An apparatus for use in a hot former to simultaneously produce an inner ring and an outer ring by cutting an elongated continuous steel round bar to a specified dimension, pressing the resulting piece by a forging machine into a workpiece including an annular portion and a smaller annular portion concentrically integrally projecting therefrom and separating the workpiece into a large annular member and a small annular member, the apparatus comprising an annular outer ring die fixedly mounted on a stationary base and having a recess for receiving the outer ring therein, an inner ring die in the form of a hollow cylinder into which the inner ring is fittable and inserted in the base in axially slidable manner, a movable ram disposed in opposing relation to the dies and having a mounting portion, an inner ring punch supported by the mounting portion and fittable into the inner ring die to punch out the inner ring, and an outer ring punch supported by the mounting portion and fittable into the outer ring die in end-to-end opposing relation to the inner ring die to separate an intermediate ring from the outer ring, the outer ring punch being fitted around the outer periphery of the inner ring punch and axially slidable, the outer ring punch having a front end movable forward and backward from the front end of the inner ring punch.

3,968,675
METHOD AND APPARATUS FOR PREPARING A MASS SPECTROMETER LEAK DETECTOR SYSTEM FOR OPERATION

Walton E. Briggs, Lynnfield, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed June 7, 1974, Ser. No. 477,248
Int. Cl.² G01M *3/04*
U.S. Cl. 73—1 G 6 Claims

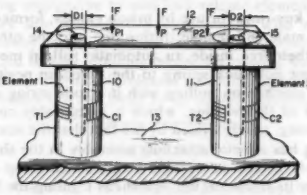


1. A method of preparing a mass spectrometer leak detector system for operation in testing for leaks, said method comprising the steps of establishing in said mass spectrometer a reduced pressure and then introducing substantially pure atmospheric air into said air system to provide in said mass spectrometer a partial pressure of the helium in said air sufficient to be detectable by said mass spectrometer while preventing the introduction of said air into the system in an amount which will damage said mass spectrometer.

3,968,676
MECHANICAL EQUALIZATION OF STRAIN GAUGE SENSITIVITY

Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Filed Mar. 24, 1975, Ser. No. 561,108
Int. Cl.² G01L *1/22, 25/00*
U.S. Cl. 73—1 B 5 Claims



1. A method of mechanically equalizing the strain gauge sensitivity of at least two spaced load elements supporting a platform on a fixed reference frame so that the output signal from strain gauges secured to the elements and connected in a strain gauge bridge circuit is the same for different positions of an applied load on the platform, comprising the steps of:

a. comparing the output signals from the bridge when a given load is first positioned off-center adjacent to one element and then shifted to an alternate position aajacent to another element; and,

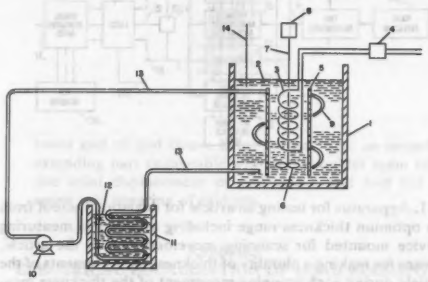
b. progressively, physically removing material from at least one of the elements to change the sensitivity until the measured output signal is the same for all positions of the applied load.

3,968,677

CONTINUOUS EVALUATION OF THERMAL STABILITY OF QUENCHING OILS

George F. Felton, Jr., Chadds Ford, and Robert E. Royer, Chester, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 12, 1975, Ser. No. 557,718
Int. Cl.² G01N 25/00
U.S. Cl. 73—15 R 3 Claims



1. A testing apparatus for use in evaluating the thermal stability of a liquid hydrocarbon oil which comprises:

a. means for providing a bath of the liquid hydrocarbon oil to be evaluated;

b. metallic member located entirely internally of said bath for heating said oil and means for heating said member;

c. mixing means located internally of said bath whereby rapid movement of said oil occurs within baffling means of (d), and means for energizing the mixing means;

d. baffling means partially enclosing the metallic member and the mixing means and the volume within the baffling means is relatively small to the total volume of the bath;

e. cooling means located outside said baffling means and located entirely internally of a said bath for maintaining the temperature of said oil external of said baffling means at a temperature substantially lower than the temperature of said member and means for maintaining cooling effect; and

f. said means for providing the bath, the metallic member, the mixing means, baffling means and cooling means are constructed of materials which do not chemically react with said oil; and

whereby the thermal stability of said oil can be determined.

3,968,678

METHOD OF DETERMINING THE RELATIVE AIR CONTENT IN AN AIR-CONTAINING LIQUID OR CREAM AND AN APPARATUS FOR CARRYING OUT THE METHOD

Ole Garne Krener, and Erik Nielsen, both of Hojbjerg, Denmark, assignors to O. G. Hoyer A/S, Aarhus-Hojbjerg, Denmark

Filed Mar. 27, 1975, Ser. No. 562,951
Claims priority, application Denmark, Apr. 5, 1974, 1911/74
Int. Cl.² G01N 7/00
U.S. Cl. 73—19 10 Claims

1. Apparatus for determining the relative air content in a product flowing through a conduit in the form of air containing liquid or cream, said apparatus comprising:

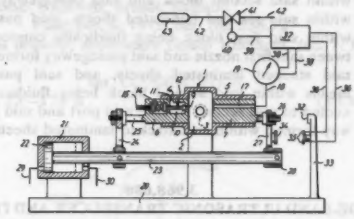
a. a housing having means for connecting the housing in a conduit for receiving a flow of the product,

b. a first cylinder and a second cylinder connected coaxially opposite one another to said housing and communicating with the interior of said housing,

c. a first piston axially displaceable with a tight fit in said first cylinder,

d. a second piston axially displaceable with a tight fit in said second cylinder,

e. a drive mechanism means connected to said pistons and arranged to displace said second piston between a first end position in which it is retracted into said second cylinder, and a second end position in which it is projected across the interior of said housing into said first



cylinder to define, in cooperation with said first cylinder and said first piston, a sampling chamber, said drive mechanism means being further arragned to move said pistons axially towards one another when said second piston has entered said first cylinder,

f. overflow duct means extending from said sampling chamber and containing an overflow valve,

g. means for keeping said overflow valve closed when pressure in said sampling chamber is below a predetermined magnitude, and

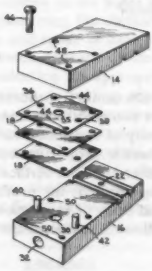
h. means for recording the pressure in said sampling chamber.

3,968,679

PNEUMATIC THICKNESS SENSOR HEAD

Frank Stephen Ralbovsky, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,876
Int. Cl.² G01B 13/06; B65H 25/08
U.S. Cl. 73—37.7 3 Claims



1. A pneumatic sensor head for monitoring the thickness of a continuously moving sheet of material passing therethrough, comprising:

a. first and second blocks having respective first and second aligned nozzles separated by a distance sufficient to receive the sheet of material passing therethrough;

b. means for admitting pressurized fluid to said first and second nozzles to sense an average variation in the back

pressure therefrom proportional to a change in the thickness of the sheet of material being monitored;

c. a plurality of removable stacked laminated sheets positioned between said first and second blocks for adjusting the distance between said first and second nozzles, whereby to enable optimum operation of said sensor head over wide variations in nominal thicknesses of monitored sheets of material, each of said laminated sheets having a hole therethrough in alignment with the hole in an adjacent one of said laminated sheets to form a passageway therein; and

d. said admitting means comprising passageway means within said first block, passageway means and a port within said second block and said passageway formed within said stacked laminated sheets, said passageway within said first block being fluidically connected between said first nozzle and said passageway formed within said stacked laminated sheets, and said passageway means within said second block being fluidically connected to said second nozzle, said port and said passageway formed within said stacked laminated sheets.

3,968,680

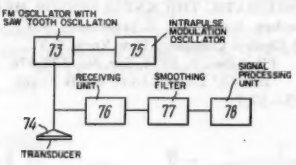
WIDE-BAND ULTRASONIC TRANSDUCER AND ITS USES

Alexeli Kharitonovich Vopilkin, ulitsa Vorovskogo, 20, kv. 9; Igor Nikolaevich Ermolov, Ryazansky prospekt, 19, kv. 50; Vladimir Ivanovich Ryzhov-Nikonov, Simonovsky val, 13, kv. 26, all of Moscow; Valery Ivanovich Ivanov, Bolnichny pereulok, 3, kv. 1, Podolsk Moskovskoi oblasti; Vladimir Izidorovich Ryk, pereulok Aksakova, 18, kv. 14, Moscow; Viktor Vasilievich Rakhmanov, Spartakovskaya ulitsa, 8, kv. 1, Kaliningrad Moskovskoi oblasti; Vladimir Dmitrievich Korolev, Volkov pereulok, 9, kv. 41, and Petr Yakovlevich Krasinsky, Malaya Filevskaya ulitsa, 40, kv. 31, both of Moscow, all of U.S.S.R.

Filed Feb. 25, 1975, Ser. No. 552,782

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.8 R **16 Claims**



1. A wide-band ultrasonic transducer comprising: a body of revolution; at least two electrodes connected to said body of revolution; said body of revolution being made of a material possessing piezoelectric properties and having one flat end face surface, its other end face surface, opposite said flat end face surface, being profiled; the profile of said profiled end face surface of said body of revolution being made in accordance with the following relationships:

$$h' = \rho \cdot h \cdot k\ (f)$$

where

ρ is the radial coordinate;

h is the thickness of said transducer, corresponding to the radial coordinate;

$k(f)$ is the frequency characteristic of said transducer;

h' is the derivative of the thickness h of the transducer with respect to the radial coordinate;

said electrodes being applied onto said flat end face surface and said profiled end face surface of said body of revolution.

3,968,681

TESTING ARTICLES

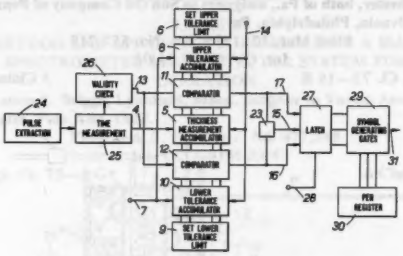
Alexander Rankin Cornforth, Stanion, and Peter John Trigg, Corby, both of England, assignors to The British Steel Corporation, London, England

Filed June 12, 1974, Ser. No. 478,488

Claims priority, application United Kingdom, June 19, 1973, 29000/73

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.5 R **16 Claims**



1. Apparatus for testing an article for deviation thereof from an optimum thickness range including a thickness measuring device mounted for scanning movement across the article; means for making a plurality of thickness measurements of the article during each scanning movement of the thickness measuring device; electrical means for accumulating the thickness measurements of successive groups of a predetermined theoretical number of measurements during each scan and comparing the sum of accumulated measurements so obtained with the sum of an equivalent accumulation of predetermined upper tolerance thickness values and with the sum of an equivalent accumulation of lower tolerance thickness values, and visual recording means for recording each group comparison with alternative symbols indicative of whether the accumulated thickness measurements for each group is within, greater than or less than the optimum thickness range.

3,968,682

PENETROMETERS

Charles Marc Marie Saint-Remy Pellissier, Avignon, France, assignor to Societe Anonyme Fondasol-Technique, Avignon, France

Filed Jan. 24, 1975, Ser. No. 543,951

Claims priority, application France, Jan. 24, 1974, 74.03868

Int. Cl.² G01N *33/24, 3/00*

U.S. Cl. 73—84 **4 Claims**

1. A penetrometer probe comprising:

a central point;

a rod connected to said point and extending the length of the probe;

a frustoconical annular member surrounding said point;

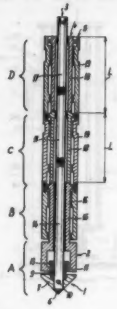
a shear pin traversing said member and said point for joint movement of said member and said point upon displacement of the latter by said rod;

a sleeve circumferentially spaced from said rod in the region of said point and extending axially along said rod directly adjacent thereto over the length of the probe;

an outer tube surrounding said sleeve and terminating above said point while extending the length of said probe, said rod, said sleeve and said outer tube being connectable to a penetration measuring device; and

coupling means in the space between said sleeve and said rod in the region of said point for conecting said sleeve and said member in force-transmitting relation enabling shearing of said pin, said coupling means comprising an annular part affixed to said member and surrounding said

rod, said annular part being of a diameter less than that of the sleeve at the lower end thereof and having an annular outwardly extending shoulder said annular part terminating below the bottom of said outer tube, said



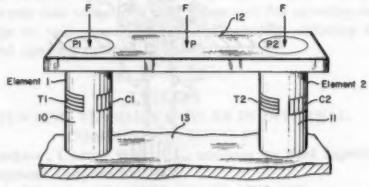
lower end of said sleeve being formed with an inwardly extending part engageable with said shoulder upon relative axial displacement of said sleeve and said rod to cause said shearing of said pin.

3,968,683

ELECTRICAL EQUALIZATION OF LOAD ELEMENT SENSITIVITY

Alfred Neuman Ormond, 11969 F. Rivera Road, Sante Fe Springs, Calif. 90670

Filed June 2, 1975, Ser. No. 582,729
Int. Cl.² G01L 1/22
U.S. Cl. 73—141 A **7 Claims**



1. A method of electrically equalizing the strain gauge sensitivity of at least two spaced load elements supporting a platform so that the output signal derived from at least four strain gauges, wherein each load element has secured to it one compression strain gauge and one tension strain gauge, is the same for different positions of a given load on the platform, comprising the steps of:

a. providing a strain gauge bridge circuit having four legs including said four strain gauges, the two compression gauges being in opposite legs and the two tension gauges being in the remaining opposite legs;

b. applying an input voltage to two opposite corners of the bridge;

c. deriving an output signal from the remaining opposite corners of the bridge;

d. comparing the output signals from the bridge when a given load is first positioned on said platform off-center closer to one element than the other and then shifted to an alternate position closer to another element than the one element;

e. shunting a compression gauge and a tension strain gauge in the leg of said bridge associated with the element exhibiting the most sensitivity with first and second substantially equal resistances of value such that the measured output signals are the same for all positions of said given load on said platforms; and

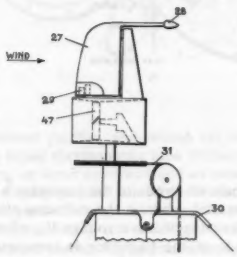
f. varying the value of one of said resistances relative to the other only to the extent necessary to avoid any shifting of the zero point of said output signal as a consequence of differences in the electrical properties of said strain gauges.

3,968,684

APPARATUS AND METHOD FOR DETERMINING OPTIMUM DIRECTION OF PROCESS OF SAILING VESSELS

Raoul Maria Johann Ottokar Karl Hafner, Clappers, Backwell Hill Road, Backwell, Bristol, England

Filed Jan. 6. 1975, Ser. No. 538.727
Claims priority, application United Kingdom, Jan. 7, 1974, 676/74
Int. Cl.² G01C 21/20
U.S. Cl. 73—178 R **13 Claims**



1. A method for use in determining a figure of merit regarding the course of a vessel in sailing from one point to a second point, comprising setting a wind vane, having a mean position between two limiting positions, relatively to the vessel with said mean position at a required angle of apparent wind with respect to the vessel, integrating of deviations of the wind vane from said mean position while steering the vessel to maintain said integration substantially at a zero value, measuring the angle of leeway between the direction of heading of the vessel and the course of the vessel, obtaining the sum of said required angle of apparent wind and said angle of leeway, using means providing a digital display to measure the distance covered by the vessel relative to the water in a given space of time, simultaneously measuring the distance covered by the vessel relative to air in said space of time, obtaining the quotient of said firstmentioned distance divided by said secondmentioned distance, selecting an appropriate one of three charts allocated respectively to beating, reaching and running modes of sailing, each said chart presenting a series of curves allocated to different figures of merit and having co-ordinates representing (*a*) the sum of the required angle of apparent wind and the angle of leeway and (*b*) the quotient of the first-mentioned distance divided by the second-mentioned distance and deriving a figure of merit from said chart based on the obtained sum and the obtained quotient.

3,968,685

TRANSISTOR ANEMOMETER

Lloyd E. MacHattie, Willowdale, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence

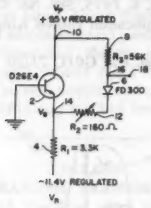
Filed Feb. 6, 1974, Ser. No. 439,997
Claims priority, application Canada, Feb. 16, 1973, 163897
Int. Cl.² G01F 1/68
U.S. Cl. 73—204 **3 Claims**

1. An anemometer comprising:

a. a transistor connected in a transistor circuit;

b. semiconductor diode compensating means connected in parallel with said transistor;

c. means for obtaining an output voltage representative of the difference between the forward voltage drop across the base-emitter junction of the transistor and the voltage drop across said semiconductor diode, whereby said output voltage is substantially independent of the ambient temperature and is proportional to the temperature rise of said transistor above the ambient temperature; and



wherein the base electrode of the transistor is connected to ground potential, wherein the collector electrode of the transistor is connected to a voltage V_p, wherein the emitter electrode of the transistor is connected through a resistor of resistance R_1 to a voltage V_n, wherein the semiconductor diode is connected on one side through a resistor having a resistance R_2 to the emitter electrode of said transistor and on the other side through a resistor having a resistance R_3 to the collector electrode of said transistor, whereby the transistor dissipation is given by the formula;

$$(V_p - V_e)\left[\frac{V_e - V_n}{R_1} - \frac{V_p}{R_3}\right]$$

whereby V_e is the forward voltage drop across the base-emitter junction of the transistor, and wherein an output terminal is connected to the junction of said diode and the resistor having a resistance R_3 whereby said output voltage is obtained at said output terminal and is the difference between V_e and the voltage drop across said semiconductor diode.

3,968,686

FLOW INDICATOR

Allen O'Neal, Park Forest, Ill., assignor to Libby, McNeil & Libby, Chicago, Ill.

Filed Sept. 24, 1974, Ser. No. 508,875
Int. Cl.² G01F 1/20
U.S. Cl. 73—207 **9 Claims**

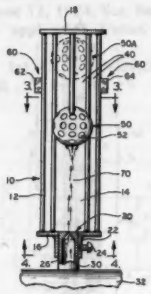
1. A flow indicator for measuring the fluid flow through a pressure cooking vessel bleeder, said indicator comprising:

an elongated housing having a fluid passage formed therethrough;

a fluid inlet opening disposed at one end of said passage and having a means for vertically securing said housing to said bleeder so that a fluid flow connection exists between said bleeder and fluid inlet opening;

a lightweight perforated indicator ball disposed within said passage; and

vertical slots having a width smaller than the diameter of said ball formed along the length of said housing and opening into said passage thereby providing for the external observation of the position of said ball with said passage and allowing fluid to escape from said passage whereby said ball is suspended in said fluid flow.

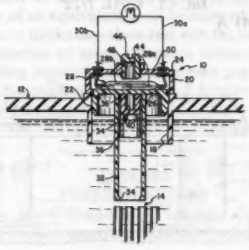


3,968,687

BATTERY ELECTROLYTE INDICATOR DEVICE

Ronald C. Fester, Rutherford, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed May 23, 1975, Ser. No. 580,480
Int. Cl.² G01F 23/12
U.S. Cl. 73—291 **9 Claims**



1. A device for determining the level and/or specific gravity of an electrolyte in a wet storage battery having an opening into a cell area, said device comprising:

a housing for fitting within said opening,

a magnetically actuated switching means carried by the housing,

float means positioned to communicate with and be moved by the electrolyte in accordance with its level and/or specific gravity,

a first permanent magnet means carried by said float means, said first permanent magnet means located with respect to said switching means to exert a magnetic force thereon, said first permanent magnet means causing said switching means to switch from a first to a second condition when said float means reaches a predetermined location in said battery electrolyte, and

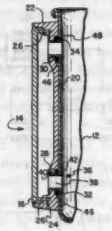
second permanent magnet means carried by said housing and located with respect to said switching means and said first permanent magnet means to exert a magnetic force on said switching means to counteract that of the first permanent magnet means to thereby adjust the position of the predetermined location of said float means where the switching action takes place.

3,968,688

LIQUID LEVEL GAUGE

John L. Eaton, Delanco, N.J., and John C. Fagan, Philadelphia, Pa., assignors to SCM Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,505
Int. Cl.² G01F 23/02
U.S. Cl. 73—328 3 Claims



1. A liquid level gauge for a generally cylindrical, thin-walled vessel comprising:

a generally rectangular, hollow housing having at least one transparent wall and a separate base wall engaging and conforming to said vessel along the length thereof;

said transparent wall having an integrally-formed flange extending therefrom;

said base wall having a flange formed with an integral slot therein for receiving said flange of said transparent wall when said walls are assembled;

a sealant securing said flange of said transparent wall to said base wall in a liquid tight manner;

a port in said base wall adjacent a corresponding port near the bottom of said vessel; and

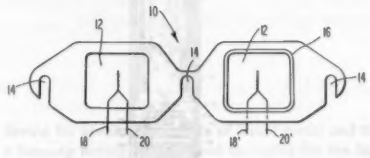
an eyelet with a flange on each end engaging the interior surface of said vessel and the exterior surface of said base wall, respectively, for providing liquid communication between said vessel and said gauge and for securing said gauge to said vessel without substantially reducing the liquid opening defined by said ports.

3,968,689

MOUNTING THERMOCOUPLES IN INTERNAL COMBUSTION ENGINES

Ervin Leshner, Cherry Hill, N.J., assignor to Fuel Injection Development Corporation, N.J.

Filed June 30, 1975, Ser. No. 591,608
Int. Cl.² G01K 1/14, 7/04, 13/02
U.S. Cl. 73—341 13 Claims



1. Apparatus for sensing the temperature of a stream of gas in an internal combustion engine having intake and exhaust ports, intake and exhaust manifolds and fastening means for coupling the manifolds to the ports, comprising:

a gasket defining a plurality of port-registering apertures which correspond to at least some of the ports for sealingly engaging and being compressed between a manifold and a surface surrounding an engine port; and

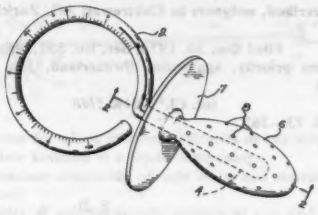
a plurality of thermocouples each comprising two wires of dissimilar metals joined at one end thereof to form a junction, said wires traversing portions of and affixed to said gasket so that each of said junctions extends within ones of said aperture.

3,968,690

COMBINED INFANT PACIFIER AND THERMOMETER

Michel Blouin, 2815 des Pruches St., Orsainville, Quebec, and Léo Mercier, 1778 Bergemont St., Quebec, Quebec, both of Canada

Filed Feb. 12, 1975, Ser. No. 549,224
Int. Cl.² G01K 1/14, 5/02
U.S. Cl. 73—343 R 4 Claims



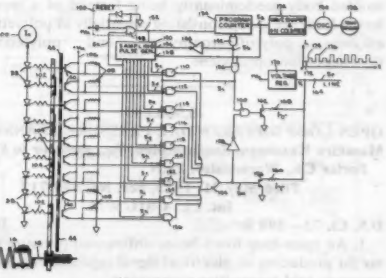
1. A combined pacifier and mouth thermometer device comprising a liquid thermometer tube including a liquid bulb portion having an inner open end and an outer closed end, a temperature display portion joined to the inner open end of the liquid bulb portion along said thermometer tube, a flexible nipple mouth-piece freely surrounding the outer end of said liquid bulb portion and having apertures therethrough placing the bulb portion in open communication with the exterior of the mouth-piece, and a stop ring secured over said tube at the junction between said bulb and said temperature display portions.

3,968,691

ENVIRONMENTAL CONDITION SENSING APPARATUS

Hayati Balkanli, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Mar. 13, 1974, Ser. No. 450,819
Int. Cl.² E21B 47/06
U.S. Cl. 73—345 11 Claims



1. Environmental condition responsive apparatus comprising:

means for sensing a first environmental condition, including means for providing a binary coded word having at least two distinct code states the permutation sequence of said code states indicative of the first environmental condition sensed,

means for sensing a second environmental condition, including means for providing a timing signal having a

frequency indicative of the second environmental sensed, and

means connected to receive said timing signal and said binary coded word for providing a composite signal indicative of the said first and second environmental condition, said composite signal having a code permutation sequence indicative of the first environmental condition sensed and a binary code sequence frequency indicative of the second environmental condition sensed.

3,968,692

THERMOSTATIC EXPANSIBLE MATERIAL-WORKING ELEMENT

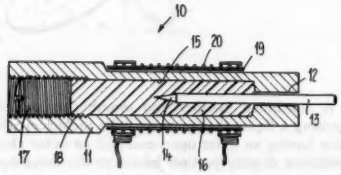
Ernst Blüttler, Stafa, and Werner Roner, Feldbach, both of Switzerland, assignors to Elektrowatt AG, Zurich, Switzerland

Filed Dec. 30, 1974, Ser. No. 537,395

Claims priority, application Switzerland, Jan. 11, 1974, 327/74

Int. Cl.² G01K 5/48

U.S. Cl. 73—363 **9 Claims**



1. A thermostatic expansible material-working element, comprising a housing having an opening and provided with an internal compartment, a molded body constituted by a thermally expansible non-elastomeric fluorinated hydrocarbon material located within said internal compartment of the housing, a substantially pin-shaped work piston which is pointed at one end, said work piston extending through said opening of the housing by means of its pointed end into the expansible material such that a portion of the circumference of the work piston and its pointed end are surrounded by the expansible material, said work piston, upon thermal expansion of the thermally expansible material, being squeezed by the expansible material and displaced by virtue of the squeezing action in a direction through said opening of the housing, said molded body predominantly being formed of a member selected from the group consisting essentially of polytetrafluoroethylene, polytrifluoroethylene and polytetrafluoroethyleneperfluoropropylene.

3,968,693

OPEN-LOOP DIFFERENTIAL-PRESSURE TRANSMITTER

Masahiro Kazahaya, Southampton, Pa., assignor to Fischer & Porter Co., Warminster, Pa.N

Filed May 21, 1975, Ser. No. 579,712

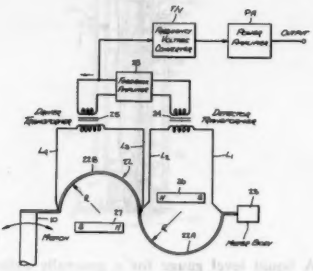
Int. Cl.² G01L 9/16

U.S. Cl. 73—398 R **16 Claims**

1. An open-loop force-beam differential pressure transmitter for producing an electrical signal representing differential pressure, said transmitter comprising:

A a measuring element including a meter body having a chamber, a force-beam mounted on a fulcrum, the lower portion of the beam below the fulcrum extending into said chamber and the upper portion thereof above the fulcrum extending outside the meter body, diaphragm means in said meter body responsive to the difference in pressure between high and low pressure inputs to produce an input force, and means to apply said force to the lower end of the beam to cause deflection of said beam about said fulcrum to a degree depending on the pressure difference,

B at least one range spring, one end of said spring being attached to a point on the upper portion of said beam and the other end to a fixed point, said spring restraining the movement of said beam to an extent whereby the movement of the beam in the measuring range of the instrument, though it exceeds about 0.001 inches, is slight and is substantially linear with respect to the applied input force, and



C a beam motion detection element coupled to the upper end of said beam and including means responsive to said slight beam motion to convert said motion into a corresponding electrical signal.

3,968,694

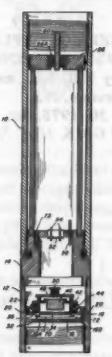
GAUGE FOR REMOTELY INDICATING THE PRESSURE OF A SUBTERRANEAN FORMATION

Kenneth K. Clark, Tulsa, Okla., assignor to Geophysical Research Corporation, Tulsa, Okla.

Filed Apr. 21, 1975, Ser. No. 569,945

Int. Cl.² G01L 9/12, 7/08; H01G 7/00

U.S. Cl. 73—398 C **8 Claims**



1. A gauge for remotely indicating pressure, comprising:

a tubular housing having a closed end forming an integral diaphragm, the exterior surface of which is subjected to the pressure to be measured in the housing having a reduced internal diameter portion adjacent said diaphragm forming an integral circumferential ledge;

a cup shaped stator element of insulating material, the stator element having a closed bottom and opened top, the external diameter of the stator element being slightly

less than the internal diameter of said housing reduced diameter portion, and having an enlarged external diameter lip portion at the top, the external diameter of the lip portion being larger than the internal diameter of said housing reduced diameter portion and slightly less than the internal diameter of said housing whereby the lip portion rests on said housing ledge to accurately position the stator element closed bottom adjacent to and spaced from the internal surface of said diaphragm forming the closed end of said housing, at least a portion of the external surface of the closed bottom portion of the stator element having a conductive surface thereon forming a capacitive relationship with said housing diaphragm portion;

a conductive cable connected to the housing by which electrical signals may be carried to a remote location; and

circuit means connected with the capacitor formed by said diaphragm and stator elements providing an A.C. signal responsive to the spacing between the diaphragm and stator element, the output of the circuit means being connected to said conductive cable.

3,968,695

DEVICE FOR TAKING SAMPLES OF MOLTEN METALS FLOWING IN PIPES

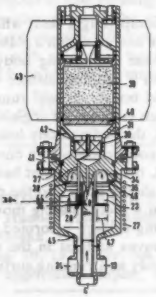
Hansjakob Weiss, Bensberg; Dieter Cremer, Bensberg-Immekeppel, and Eginhard Kranz, Cologne, all of Germany, assignors to Interatom Internationale Atomreaktorbau GmbH, Bensberg, Cologne, Germany

Filed Aug. 28, 1975, Ser. No. 608,702

Claims priority, application Germany, Sept. 11, 1974, 2443559

Int. Cl.² G01N *1/10*

U.S. Cl. 73—422 R **14 Claims**



1. A device for obtaining samples of liquid metal and comprising a housing having an inlet and an outlet for the liquid metal, and containing crucibles having open tops and which can be filled while in the housing with the liquid metal and subsequently removed from the housing; wherein the improvement comprises positioning means in said housing for positioning said crucibles so they form a horizontal ring of crucibles, said inlet comprising a vertical feed pipe extending upwardly in said housing within said ring of crucibles and having an open top for the upward ejection of the liquid metal at a level above the open tops of the ring of crucibles, and baffle means for forming a baffle surface spaced above the feed pipe's open top and the open tops of said ring of crucibles, said baffle surface being contoured to deflect liquid metal ejected upwardly from the feed pipe's open top, downwardly into the open tops of said ring of crucibles.

3,968,696

DEVICE FOR TAKING SAMPLES OF SLURRIES OR OF ANY SUSPENSION OF PARTICULATE MATERIAL IN LIQUID AND FOR MEASURING DESIRED CHEMICAL OR PHYSICAL PROPERTIES OF SUCH SAMPLES

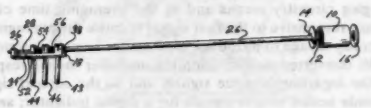
Frank Rosenblum, Ville St. Laurent, Canada, assignor to Noranda Mines Limited, Ontario, Canada

Filed Mar. 6, 1975, Ser. No. 555,719

Claims priority, application Canada, Apr. 3, 1974, 196721

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.4 R **20 Claims**



1. A device for taking samples of slurries or any suspension of particulate material in a liquid comprising:

a. a container consisting of side walls and movable end closures;

b. a holder of suitable length secured at one end to said container for immersing the container into a body of slurry or liquid; and

c. means associated with said holder for tightly closing the end closures against the walls of the container and for opening at least one of said movable end closures, said means for closing and opening said end closures comprising separate connections associated with said holder and attached to each of said end closures, a handle assembly mounted at the other end of said holder and including separate handles for operating said connections, and spring means also mounted on said holder for biasing said connections with respect to each other in a direction such as to close the end closures.

3,968,697

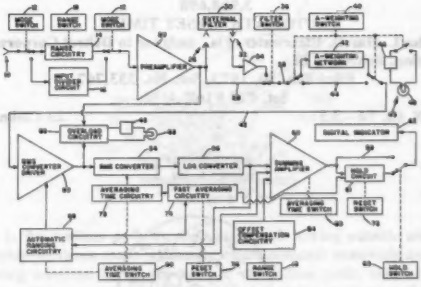
SOUND LEVEL METER

John Stefan Mutziger, East Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 30, 1975, Ser. No. 582,508

Int. Cl.² G01H *3/14*

U.S. Cl. 73—557 **10 Claims**



1. A sound level meter comprising: preamplifier means responsive to the output of a sound transducer to provide an amplified signal proportional to the input to the sound transducer; RMS converter driver means for receiving and processing the amplified signal and switchable between a lower or higher level to produce a plurality of selectable output signals; RMS converter means connected to the RMS converter driver means for receiving and processing the driver means output signals to produce RMS value signals; log converter means for receiving and processing the RMS value signals to produce

logarithmic value signals; automatic ranging circuitry means connected between the log converter means and the RMS converter driver means for receiving and processing the logarithmic value signals above or below a predetermined value to switch the RMS converter driver means respectively between the lower or higher level; said automatic ranging circuitry means including means for producing a first and second signals indicative of the switch of the RMS converter driver means; averaging time circuitry means connected to the RMS converter means for introducing a plurality of times over which the driver means output signals can be averaged in the RMS converter and means to produce the RMS value signals; fast averaging circuitry means connected to the automatic ranging circuitry means and to the averaging time circuitry means responsive to the first signal to cause the averaging time circuitry means to introduce a minimum averaging time to the RMS converter means; summing amplifier means responsive to the logarithmic value signals and to the second signal to provide scaled output signals for a digital indicator; and hold circuit means selectively connectible between the log converter means and the digital indicator for maintaining the highest value signal of the scaled output signals.

8. A sound level meter comprising: preamplifier means responsive to the output of a sound transducer to provide an amplified signal proportional to the input to the sound transducer; RMS converter driver means for receiving and processing the amplified signal to produce a driver means output signal; RMS converter means connected to the RMS converter driver means for receiving and processing the driver means output signal to produce RMS value signals; log converter means for receiving and processing the RMS value signals to produce logarithmic value signals; amplifier means responsive to the logarithmic value signals to provide scaled output signals for a digital indicator; averaging time circuitry means connected to the RMS converter means for introducing a plurality of different time intervals over which the driver means output signals can be averaged in the RMS converter means to produce the RMS value signals; fast averaging circuitry means connected to the averaging time circuitry means for introducing a minimum averaging time thereto; and hold circuit means selectively connectible between the log converter means and the digital indicator for maintaining the highest value signal of the scaled output signals responsive to the introduction of the minimum averaging time to release the highest value signal and maintain a subsequent highest value signal.

3,968,698

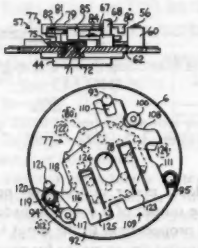
AUTOMATIC RESET TIMER

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Filed Feb. 20, 1973, Ser. No. 333,767

Int. Cl.² F16H 5/74

U.S. Cl. 74—3.5 **23 Claims**



1. In a control device, drive member means having operating abutment means, means for actuating the drive member means and arranged for selectively moving the abutment means through either a first operating range or a second operating range, a driven member arranged to be actuated by engagement and disengagement with the abutment means, and adjustable selective means associated with the driven member for selecting when the driven member responds to movement of the drive member means, said selective means being constructed and arranged to shift at least a portion of the driven member relative to said first and second operating ranges, said selective means including means for maintaining same in a plurality of adjusted positions.

3,968,699

DRIVE SYSTEM

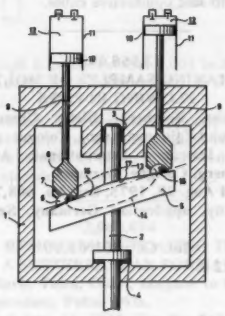
Henricus Cornelis Johannes van Beukering, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 6, 1974, Ser. No. 476,891

Claims priority, application Netherlands, June 22, 1973, 7308702

Int. Cl.² F16H 23/00

U.S. Cl. 74—60 **14 Claims**



1. A drive system comprising a shaft which is journalled to be rotatable in a frame and on which a plate is provided which cooperates with at least one sliding body, one flat side of which cooperates with a running surface on the side of the plate which faces said body, the said running surface being formed by a face which encloses an angle with the center line of the rotatable shaft, the sliding body being provided with a spherical face which cooperates with a corresponding face in a head of a drive rod, the arrangement being such that when the shaft rotates, the sliding body and the drive rod cooperating therewith perform a reciprocating movement, characterized in that the running surface is formed by a face which is constructed to be convex at least in the relative movement direction of sliding body and running surface.

3,968,700

DEVICE FOR CONVERTING ROTARY MOTION INTO A UNIDIRECTIONAL LINEAR MOTION

Calvin I. Cuff, 135 Ocean Ave., Brooklyn, N.Y. 11225

Filed Aug. 1, 1974, Ser. No. 493,748

Int. Cl.² F16H 27/04

U.S. Cl. 74—84 S **2 Claims**

1. In a device that converts rotary motion into unidirectional motion by varying the radius of gyration of a plurality of gyrating masses which device includes means for both supporting and permitting sliding radial movement of said plurality of gyrating masses, the improvement comprising:

a shaft;

a hub mounted on said shaft;

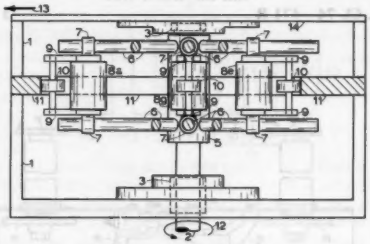
two, identical, axially spaced-apart sets of cylindrical arms fixed to and extending radially from said hub;

a plurality of bearings each mounted on one of said radially extending cylindrical arms for sliding linear movement with respect thereto;

said cylindrical arms in each of said sets being secured at one end to and spaced at equal angular intervals about the circumference of said hub such that each arm of one of said sets is in substantial alignment with an arm of the other of said sets to provide aligned pairs of arms having aligned pairs of bearings thereon;

each of said radially moveable gyrating masses being mounted between the said sets of arms by securement to both members of a pair of bearings on each of a pair of aligned arms;

a wheel or roller type cam-follower for each of said gyrating masses;



means for supporting each of said wheel or roller type cam-followers in fixed relationship to their respective gyrating masses;

a circular cam track in radially spaced and encircling relationship with respect to said gyrating masses and eccentrically disposed with respect to the axis of said shaft;

said wheel or roller type cam-followers being maintained in rolling contact with said cam track by the centrifugal force produced by said gyrating masses during rotation of said shaft; and

means for rotating said shaft.

3,968,701

POSITIVE MOTION BELT WITH ELASTIC TEETH

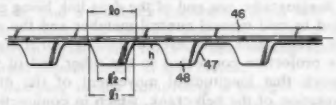
Masao Maruyama, Hanno, Japan, assignor to Tsubakimoto Chain Co., Ltd., Osaka, Japan

Filed Jan. 10, 1975, Ser. No. 540,255

Claims priority, application Japan, May 24, 1974, 49-057783

Int. Cl.² F16G *1/28, 1/00;* B29H *7/22*

U.S. Cl. 74—229 **6 Claims**



1. In a positive motion endless belt having elastic teeth, said teeth having side faces adapted for engagement with a toothed wheel, comprising the improvement wherein the side faces are formed by a concave involute curve.

3,968,702

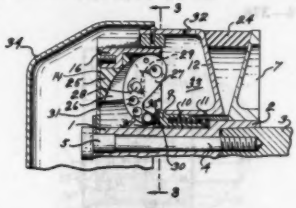
CENTRIFUGALLY CONTROLLED EXPANSIBLE PULLEY WITH MANUALLY ENGAGED NEGATIVE TORQUE RESPONSIVE MEANS

Guy Beaudoin, Drummondville South, and Marcel Vincent, Wickham, both of Canada, assignors to Skiroule Ltee, Wickham, Canada

Filed Jan. 14, 1975, Ser. No. 541,072

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 E **6 Claims**



1. A variable diameter pulley comprising shaft means, a first and a second pulley flanges coaxially mounted on said shaft means, said first pulley flange being axially displaceable along said shaft means, a centrifugal weight carrier having a part fixedly secured to said shaft means, bodily rotatable therewith, and including an external circumferential surface having axially extending guideways thereon, centrifugal weights pivotally mounted on another part of said carrier and operatively engaging said first pulley flange for axial displacement of the latter, and follower members secured to the periphery of said first pulley flange for axial displacement therewith in slidable and non-rotatable engagement with said guideways respectively, and axially displaceable bodily with said first pulley flange along said guideways in response to centrifugal action on said centrifugal weights.

3,968,703

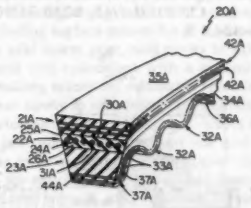
ENDLESS POWER TRANSMISSION BELT

Bernard R. Bellmann, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 24, 1975, Ser. No. 543,837

Int. Cl.² F16G *1/28, 5/20, 5/08*

U.S. Cl. 74—231 C **16 Claims**



1. An endless power transmission belt having outside and inside surfaces made primarily of elastomeric materials and being adapted to be operated in an endless path, said belt comprising, a tension section, load-carrying means, and a compression section, at least one of said sections having a plurality of stiffening members extending the full width thereof, each of said members having a substantially flat non-circular cross-sectional configuration which provides transverse rigidity for said belt yet enables said belt to be made of minimum height perpendicular its outside and inside surfaces when viewing said belt in cross section, said minimum height enabling said belt to operate at a lower temperature which extends the service life thereof, said members being arranged in at least one layer along said endless path and in parallel

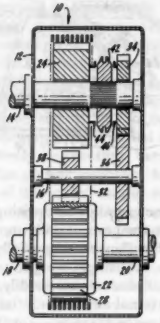
relationship, said members being held in interconnected by comparatively weak tie bands extending substantially parallel to said endless path.

3,968,704

POWER TRANSFER MECHANISM

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 25, 1974, Ser. No. 526,982
Int. Cl.² F16H 3/10
U.S. Cl. 74—376 21 Claims



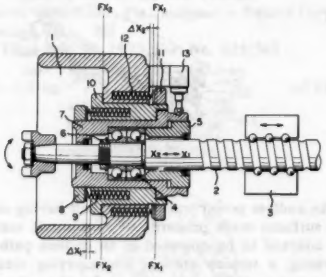
1. In a power transfer mechanism for coupling power input means with power output means, the combination comprising a chain drive train engageable with said power means for effecting power transfer therebetween, said chain drive train including a pair of sprockets defining sprocket teeth and a chain engaging said teeth, a gear drive train engageable with said power means for effecting power transfer therebetween, said gear drive train including a gear meshing with said teeth of one of said sprockets, and means for selectively engaging said drive trains with said power means.

3,968,705

OVERLOAD SAFETY DEVICE

Hitoshi Amano, Tokyo, and Yoshifumi Tsuchiya, Ohme, both of Japan, assignors to Takayuki Nomura, Tokyo, Japan

Filed Jan. 10, 1975, Ser. No. 540,243
Int. Cl.² F16H 1/18; B23B 21/00
U.S. Cl. 74—424.8 R 4 Claims



1. An overload safety device for a machine having a feed screw and a body comprising:

a first sleeve mounted to said feed screw to move axially therewith relative to said body;

a second sleeve slidably mounted to the outer periphery of said first sleeve and the inner periphery of said body;

a first spring between said first and second sleeves biasing said first sleeve in a first axial direction relative to said second sleeve;

a second spring between said second sleeve and said body biasing said second sleeve in an axial direction opposite said first axial direction; and

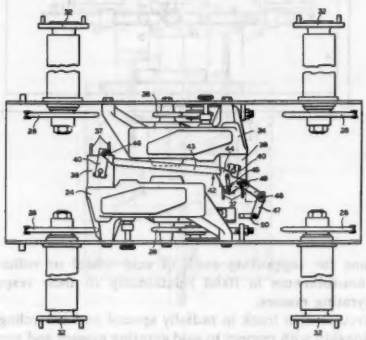
a switch mounted to said body to detect movement of said feed screw and first sleeve in both axial directions.

3,968,706

TWO-SPEED MOTOR CONTROL FOR DUAL HYDROSTATIC TRANSMISSIONS

James J. Bauer, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 400,462, Sept. 24, 1973, Pat. No. 3,938,401. This application Feb. 6, 1975, Ser. No. 547,537
Int. Cl.² G05G 9/00
U.S. Cl. 74—471 R 1 Claim



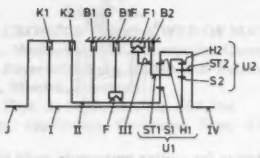
1. A two-speed control for dual hydrostatic motors spaced with the output shafts extending in opposite directions on different axes, each motor having a rotating piston group and a swash plate inclinable to a high or low speed position of piston displacement, said control comprising a shift lever interconnecting the swash plate of the motors operable in one direction to cause both swash plates to be shifted to one position and vice versa, a manual control lever movable between high and low speed positions, and a linkage connecting the manual control lever and shift lever operable upon movement of the manual control member to move the shift lever in one or the other of said positions corresponding to either the high or low speed positions of the swash plate, and wedging means acting to yieldably hold the shift lever in the position selected against the returning force acting on the swash plates by said piston groups, said linkage comprising a drag link, a bell crank pivoted horizontally, one end of the drag link being pivotally connected to said manual control member and the other to said bell crank, said shift lever extending horizontally and having a projection connected to the other end of the bell crank, such that longitudinal movement of the drag link causes rotation of the bell crank, which in conjunction with the slide and guide wedging motion, produces a longitudinal lateral shifting movement of said shift lever, and an over-center spring mechanism acting on said manual control member offset relative to its pivot axis so as to hold said member on either side of a midposition yet permitting the operator to move the control member between the low or high speed positions by overcoming the biasing force of the over-center spring mechanism.

3,968,707

HYDRAULIC SPEED-CHANGING SYSTEM

Hansjörg Dach, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Dec. 2, 1974, Ser. No. 528,940
Claims priority, application Germany, Dec. 5, 1973, 2360513
Int. Cl.² B60K 41/18; G05G 21/00
U.S. Cl. 74—869 7 Claims



1. In a transmission system connected between a fuel-powered engine and an output shaft driven thereby, in combination:

gear-shifting means for switching between a plurality of forward speed ratios and a reverse speed ratio of said output shaft with reference to said engine, said gear-shifting means including a fluid-operated clutch actuatable to establish one forward speed ratio and said reverse speed ratio;

a speed selector having a forward position and a reverse position;

an operator-controlled accelerator for varying the fuel supply to said engine;

switchover means controlled by said speed selector and responsive to the position of said accelerator and to the speed of said output shaft for actuating said clutch in said reverse position and under certain load conditions in said forward position of said speed selector; and

damping means responsive to said speed selector for retarding full operation of said clutch by a first delay period in said forward position and by a second delay period shorter than said first delay period in said reverse position thereof;

said switchover means comprising a control valve inserted between said clutch and a source of pressure fluid therefor;

said control valve including a cylinder with a piston, biasing means tending to hold said piston in a normal position enabling rapid flow of fluid from said source to said clutch, and a feedback connection from said clutch to said cylinder for shifting said piston into a throttling position against the force of said biasing means upon partial pressurization of said clutch;

said damping means comprising a plunger mechanically linked with said piston and fluidically connected to said clutch for displacement in a direction restoring said piston to said normal position upon further pressurization of said clutch;

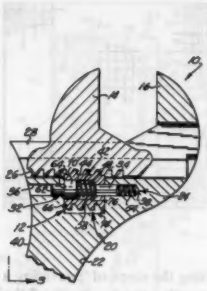
said control valve being provided with an ancillary inlet connected to said source in said reverse position of said speed selector for subjecting said piston to a supplemental force aiding the force of said biasing means in said reverse position of said speed selector.

3,968,708

ADJUSTABLE WRENCH

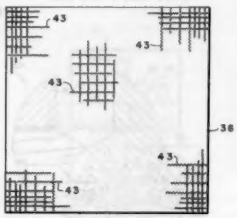
Charles B. Ingersoll, Orchard Park, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 25, 1974, Ser. No. 526,904
Int. Cl.² B25B 13/16
U.S. Cl. 81—157 16 Claims



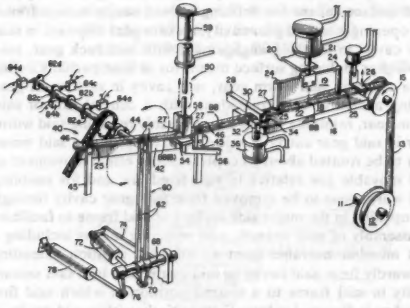
1. A wrench comprising a frame having major and minor side surfaces, a fixed jaw connected with said frame, a movable jaw slidably mounted on said frame for movement toward and away from said fixed jaw, a rack gear connected with said movable jaw, said frame including first surface means for at least partially defining a gear cavity in said frame adjacent to said rack gear, said gear cavity having at least one opening in the major side surface of said frame, said frame further including second surface means for at least partially defining a second cavity in said frame and opening into said gear cavity and third surface means for defining a third cavity in said frame and opening into said gear cavity, a worm gear disposed in said gear cavity in meshing engagement with said rack gear, said worm gear including surface means for at least partially defining a cavity in said worm gear, said cavity in said worm gear having a central axis coincident with a central axis of said worm gear, retaining means for releasably retaining said worm gear in said gear cavity in said frame, for enabling said worm gear to be rotated about its central axis to effect movement of said movable jaw relative to said fixed jaw and for enabling said worm gear to be removed from said gear cavity through the opening in the major side surface of said frame to facilitate disassembly of said wrench, said retaining means including a first member movable from an engaged position extending outwardly from said cavity in said worm gear into said second cavity in said frame to a second position in which said first member is disposed substantially entirely within said cavity in said worm gear to at least partially release said worm gear for movement through said opening in said major side surface of said frame in a direction transverse to the central axis of said worm gear and a second member extending outwardly from said cavity in said worm gear into said third cavity in said frame, said first and second members being cooperable with said frame and said worm gear to support said worm gear for rotation about its central axis, and spring means disposed in said third cavity in said frame for resiliently urging said second member toward said worm gear, said first member being movable in said cavity in said worm gear to move said second member against the influence of said spring means.

3,968,709
CARPET TILE MACHINE
James E. Fowler, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Division of Ser. No. 542,110, Jan. 20, 1975. This application Aug. 7, 1975, Ser. No. 602,694
Int. Cl.² B26D 3/08
U.S. Cl. 83—1 1 Claim



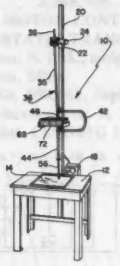
1. tile comprising the steps of: providing a carpet tile having a hardback, contacting the hardback of the carpet tile with a cutting die and applying pressure thereto to cut a plurality of substantially continuous lines of varying depth in the hardback of the carpet tile.

3,968,710
APPARATUS AND METHOD FOR MANUFACTURING RESILIENT BANDS
Chajim Gros, 172, Gladstone Park Gardens, London, NW. 2 GRL, England
Filed Dec. 26, 1974, Ser. No. 536,464
Claims priority, application United Kingdom, Dec. 29, 1973, 60165/73
Int. Cl.² B26D 7/06, 7/14
U.S. Cl. 83—18 10 Claims



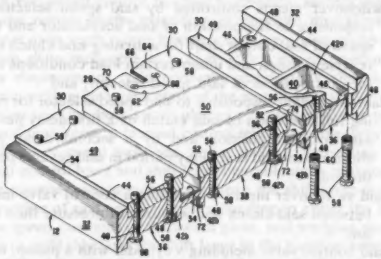
1. Apparatus for use in the manufacture of resilient bands from an elongated strip or web of resilient material comprising slitting means for preliminary cutting longitudinally extending and longitudinally spaced slits in said strip, means for repetitively severing separate lengths from said strip, said severing taking place transversely in the region between said longitudinal slits, whereby each severed length forms an endless band, and band-engaging and supporting means for receiving and holding each band before it has been completely severed from the remainder of said strip.

3,968,711
PATTERN CUTTING APPARATUS
William Donald Wilson, Barrington, R.I., assignor to Huestic Machine Corporation, Bristol, R.I.
Filed Nov. 24, 1975, Ser. No. 634,476
Int. Cl.² B26D 7/10
U.S. Cl. 83—171 10 Claims



1. A device for cutting patterns in mold blocks and the like comprising, a frame, a rigid rod attached at one end thereof to said frame for pivotal movement therewith, said rod having tracing means at the other end thereof for tracing a pattern and an offset portion intermediate said ends, said offset portion defining a discontinuity in said rod, means for supporting a block within said offset portion, and cutting means tightly spanning said discontinuity for cutting said block in a pattern corresponding to a pattern traced by said tracing means, said cutting means comprising a spring-loaded, electrically heated wire.

3,968,712
FABRICATED TABLE FOR STATIONARY POWER TOOLS
John L. Duncan, Pickens, S.C., assignor to The Singer Company, New York, N.Y.
Filed May 1, 1975, Ser. No. 573,657
Int. Cl.² B23D 19/00; B26D 1/18; B27B 5/28, 27/04
U.S. Cl. 83—477.2 5 Claims



1. A fabricated table for a stationary power tool comprising:
a. a frame made of a lightweight material,
b. at least one channel formed in the top surface of the frame to divide the frame into sections,
c. a plurality of bosses formed in the frame with aperatures therethrough,
d. a plurality of steel plates, one atop each frame section, and disposed on either side of the channel,
e. a plurality of tapped holes formed in the steel plates in alignment with the apertures in the bosses, and
f. threaded means extending through the apertures in the bosses to be threadedly received in the tapped holes of each of the steel plates to secure the steel plates to the frame, whereby the top surface of the steel plate to be machined to provide a coplanar surface thereon.

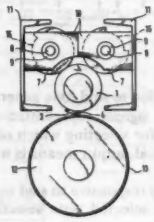
4. The combination claimed in claim 1 wherein:
a. the frame sections between the channel are substantially open areas,
b. rib members are formed integrally with the frame to extend in the open areas, and
c. the bosses are formed at some of the rib members.
5. The combination claimed in claim 4 wherein:
a. a motor is mounted to the frame,
b. a blade slot for a saw blade is formed in one of the plates,
c. a saw blade is rotatively carried on the frame to extend through and vertically above the blade slot, and
d. means connecting the saw blade to the motor, whereby the saw blade is driven by the motor and is adapted to cut any work translated upon the table into engagement with the saw blade.

3,968,713

MACHINE FOR CROSS-CUTTING A WEB OF MATERIAL

Hans Mosburger, Weiherhammer, Oberpfalz, Germany, assignor to BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft, Munich, Germany

Filed Sept. 2, 1975, Ser. No. 609,364
Claims priority, application Germany, Sept. 19, 1974, 2444704
Int. Cl.² B26D *1/36*
U.S. Cl. 83—347 **9 Claims**



1. Machine for cross-cutting a web of material comprising, a knife blade carried in a rotatable knife carrier arranged transverse to the web of material, a plurality of supporting plates arranged in supporting engagement with said blade along the entire length thereof, said knife carrier and said plates being drivable rotatively in synchronization, said knife carrier having a low mass moment of inertia, said support plates being of generally circular configuration, and each plate having a recess formed on the circumference thereof to permit passage of the knife blade therethrough.

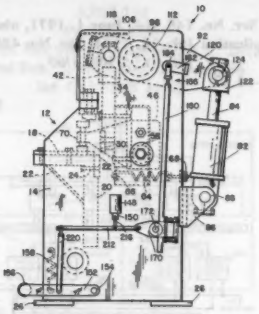
3,968,714

HEAVY DUTY SHEAR

Charles Kuchyt, R.R. No. 3, Box 118, Shelbyville, Ind. 46176

Filed Jan. 11, 1974, Ser. No. 432,528
Int. Cl.² B26D *5/12*
U.S. Cl. 83—582 **12 Claims**

1. A shear including a frame, fixed blade means mounted on said frame movable blade means cooperating with said fixed blade means to cut sheet material disposed therebetween, power means for moving said movable blade means upwardly and downwardly past said fixed blade means, and means for connecting said power means to said movable blade means, wherein the improvement comprises means for guiding said movable blade means for such movement past said fixed blade means, said guiding means including bracket means mounted on said frame for selectively adjustable movement relative to said fixed blade means, roller means journal mounted upon said bracket means for rotation about an axis generally perpendicular to the direction of movement of said movable blade means, and means for yieldably urging said movable blade means against said roller means, said power means including a power cylinder having a ram as a driver, and said connecting means including lever means mounted on said frame for pivotal movement about an axis generally parallel to the journal axis of said roller means and providing oppositely extending lever portions, means for pivotally connecting said movable blade means to one of said lever portions and means for pivotally connecting said ram to the other of said lever portions, said means for pivotally connecting said movable blade means to said one lever portion including a bearing block supporting said movable blade means, said bearing



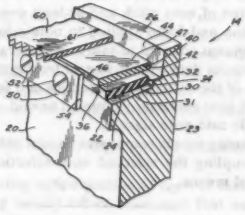
block providing a cylindrical bore parallel to the pivot axis of said lever, a cylindrical trunnion mounted upon said one lever portion parallel to said pivot axis and extending through said bore, and an eccentric sleeve having internal and external cylindrical surfaces formed respectively about parallel spaced apart axes, the internal surface of said sleeve receiving said trunnion and the external surface of said sleeve being received in said cylindrical bore, whereby the position of said bearing block relative to the pivot axis of said lever is determined by the rotational position of said eccentric sleeve on said trunnion.

3,968,715

VIBRATION RESISTANT BAND SAW WHEEL

Charles E. Cleland, Edina, Minn., assignor to Continental Machines, Inc., Savage, Minn.

Filed June 27, 1975, Ser. No. 590,816
Int. Cl.² B26D *1/54*
U.S. Cl. 83—820 **15 Claims**



1. A vibration resistant band wheel arrangement for a band saw of the type having an endless cutting band trained in tension around the peripheral surfaces of spaced band wheels, comprising:
a band wheel having a disc body portion surmounted by a peripheral surface;
a flange extending radially outward at the edge of said peripheral surface of said band wheel disc body portion;
a resilient tire fitted over said peripheral surface of said disc body portion;

a contact tire fitted above said peripheral surface of said disc body portion over said resilient tire;

retainer means for retaining said resilient tire and said contact tire in position on said band wheel over said peripheral surface.

3,968,716

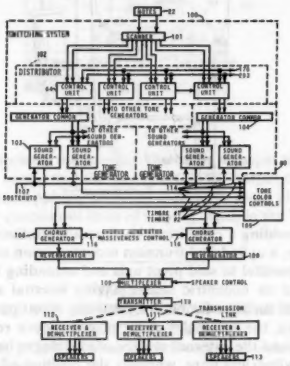
MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Chochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.

Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 490,386

Int. Cl.² G10H *3/00*

U.S. Cl. 84—1.13 **24 Claims**



1. Sound generating apparatus comprising,

output means,

a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,

a plurality of note selecting means for selecting note signals characteristic of selected notes for production to said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of note pitch and at least one of speed of note selection and force applied to note selecting means,

control means coupled to said tone generators for providing continuous data signals to said tone generators representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signals,

and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means.

3,968,717

MUSICAL INSTRUMENT WITH MEANS FOR SCANNING KEYS

Melville Clark, Jr., Cochituate, and David A. Luce, Natick, both of Mass., assignors to Melville Clark, Jr., Cochituate, Mass.

Division of Ser. No. 148,514, June 1, 1971, abandoned. This application July 22, 1974, Ser. No. 491,159

Int. Cl.² G10H *1/02*

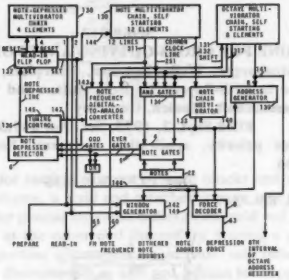
U.S. Cl. 84—1.19 **3 Claims**

1. Sound generating apparatus comprising,

output means,

a plurality of tone generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,

a plurality of note selecting means for selecting note signals characteristic of selected notes for production by said tone generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note selection signal is representative of at least one of note pitch, speed of note selection and force applied to note selecting means,



control means coupled to said tone generators for providing continuous data signals representative of the selected note signals and for selecting which of said tone generators coupled to said output means is to provide said note signals,

and scanning means responsive to said note selecting means for coupling the selected note selection signals to said control means,

and further comprising means for connecting two tone generators together when said note selecting means selects two notes to produce a composite tone frequency controlling signal dependent upon the degree of selection of the two notes.

3,968,718

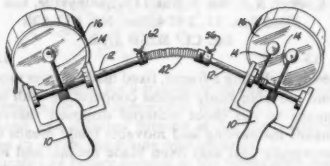
DRUM TYPE MUSICAL INSTRUMENT

Earl Randy Carver, Forest City, N.C., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Aug. 11, 1975, Ser. No. 603,769

Int. Cl.² G10D *13/02*

U.S. Cl. 84—422 R **4 Claims**



1. A drum type musical instrument comprising:

first and second drums;

first and second pedal actuated beater means, each means having a mechanism with a horizontal shaft for controlling the position of a drum beater that will beat a corresponding one of the drums, the shafts being disposed end to end with one end of one shaft adjacent one end of the other shaft;

an elongated flexible resilient coil spring;
a first cylinder at one end of the spring;
a second cylinder at the other end of the spring;
first attachment means detachably securing the first cylinder to said one end of said one shaft; and
second attachment means located at said one end of said other shaft for receiving the second cylinder and detachably securing the cylinder to said other shaft, the second attachment means having a recess within which the second cylinder can be rotated to a desired angular position relative to the first cylinder prior to being detachably secured to said other shaft, whereby the spring can be pre-tensioned to the degree desired.

3,968,719

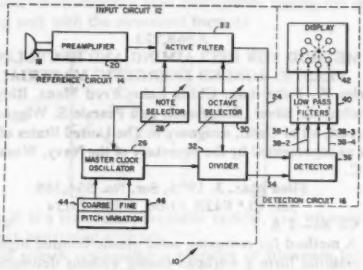
METHOD FOR TUNING MUSICAL INSTRUMENTS

Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Continuation-in-part of Ser. No. 399,990, Sept. 24, 1973, abandoned, which is a division of Ser. No. 249,942, May 3, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,921

Int. Cl.² G10G 7/02

U.S. Cl. 84—454 **10 Claims**



1. A method for tuning a musical instrument comprising a plurality of adjustable frequency tone generators and frequency adjustment means for each tone generator, each tone generator producing a plurality of partials, the partials being of different order with the first order partial for each tone generator corresponding to the lowest frequency produced thereby and with the higher order partials for each tone generator differing in frequency from corresponding order mathematical harmonics of the lowest frequency, said method comprising the steps of:

A. measuring the inharmonicity of the musical instrument by:
i. energizing one of the tone generators to transmit a tone therefrom,
ii. measuring, with a tuning device including means for indicating the frequency of the tone from a tone generator, the frequency of a partial of a selected order of the tone, and
iii. measuring with the tuning device the frequency of another partial of the tone to obtain a characteristic inharmonicity for the musical instrument,

B. tuning a reference one of the tone generators to a predetermined standard frequency by:
i. energizing the reference tone generator to transmit a tone therefrom, and
ii. adjusting the corresponding frequency adjustment means until the tuning device indicates that the tone is at the predetermined standard frequency, and

C. tuning successive ones of the tone generators having different first partials from the reference tone generator, each successive such tuning step including:
i. energizing the corresponding one of the tone generators to transmit a tone therefrom, and
ii. adjusting the corresponding frequency adjustment means until the tuning device indicates that the tone is at a corresponding tuning frequency which is the sum of a mathematical frequency for that corresponding tone generator and a deviation frequency that is dependent upon the characteristic inharmonicity of the musical instrument.

3,968,720

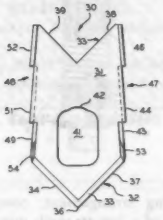
FASTENERS

Hugh Black, P.O. Box 953, Waynesville, N.C. 28786

Filed Feb. 3, 1975, Ser. No. 546,288

Int. Cl.² F16B 15/00

U.S. Cl. 85—11 **4 Claims**



1. A fastener for securely joining material sections together,
said fastener comprising a main body section,
said main body section having a leading end and a trailing end and sides connecting said leading end and said trailing end,
said leading end being tapered and being wider than said trailing end,
said main body section having an aperture therein substantially centrally located,
peripheral walls depending from each of said sides of said main body section,
each of said peripheral walls having a first extending spline portion,
said first extending spline portion of each of said peripheral walls being opposite to each other and both extending in a first direction substantially normal to said main body section and being spaced apart by said main body section,
said first extending spline portion of each of said peripheral walls being located the same distance from said leading end,
said peripheral walls each having a second extending spline portion,
said second extending spline portion of each of said peripheral walls being axially offset from said first extending spline portion without any overlapping and being further from said leading end than said first extending spline portion of each of said peripheral walls,
said second extending spline portion of each of said peripheral walls being opposite to each other and being in an axial extending section of the peripheral walls where there is no first extending spline portion,
said second extending spline portion of each of said peripheral walls both extending in a second direction substantially normal to said main body section and being spaced apart by said main body section, and
said first and second directions being opposite each other.

3,968,721

EXPANSION ANCHOR WITH SAFETY FEATURE

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

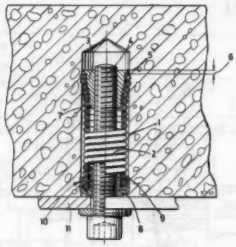
Continuation of Ser. No. 446,922, Feb. 28, 1974, which is a continuation-in-part of Ser. No. 280,885, Aug. 15, 1972, Pat. No. 3,837,257. This application June 27, 1975, Ser. No. 591,063

Claims priority, application Germany, Aug. 17, 1971, 2141079; Sept. 14, 1971, 2145918; Dec. 15, 1971, 2162255; Dec. 24, 1971, 2164587

The portion of the term of this patent subsequent to Sept. 24, 1991, has been disclaimed.

Int. Cl.[2] E04B *1/41*

U.S. Cl. 85—64 5 Claims



1. An anchoring arrangement, comprising a supporting structure formed of a low-strength material having a known breaking strength when a predetermined pressure is exerted thereto, said supporting structure having wall portions bounding an anchor hole; an expansion anchor sleeve in form of a wire spring received in said anchor hole of said supporting structure and having a leading end and a trailing end; an expander member at said leading end and adapted to enter into said expansion anchor sleeve in direction towards said trailing end; actuating means extending through said expansion anchor sleeve from said trailing end to said expander member and being connected with the same, said actuating means being operative for drawing said expander member into said expansion anchor sleeve and for thereby pressing said expansion anchor sleeve outwardly against said wall portions; and break-away means on said expander member in abutment with said leading end of said expansion anchor sleeve for limiting axial movement of the latter so long as the pressure exerted by said expansion anchor sleeve against said wall portions bounding said anchor hole is below said predetermined pressure required for breaking said low-strength material of said supporting structure, and for breaking off from said expander member when said predetermined pressure is exceeded, said break-away means comprising a break-away flange having an axial thickness so selected that said flange will shear off from said expander member before the force exerted by said expansion anchor sleeve against said wall portions bounding said anchor hole can reach said predetermined pressure.

3,968,722

MUSICAL KEYS AND INTERVALS TEACHING DEVICE

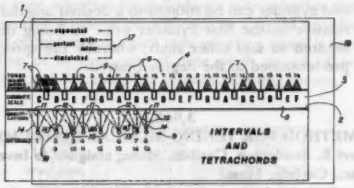
Georges A. Cournoyer, 480 Chapman St., St. Bruno, Quebec, Canada

Filed Dec. 9, 1974, Ser. No. 531,196

Int. Cl.[2] G09B *15/02*

U.S. Cl. 84—473 6 Claims

1. A musical scales and intervals teaching device comprising a first member and a second member movably connected one to the other, a chromatic scale having the musical notes equidistantly marked in equidistant tonal relationship on one face of said first member and arranged for endwise displacement relative to said second member, and an intervals indicator marked on one face of said second member laterally adjacent to said chromatic scale and including coded pointers and predetermined points spaced from said chromatic scale with



said coded pointers extending from said predetermined points and leading toward the chromatic scale in predetermined spaced-apart relationship to distinctively indicate the qualifications of any simple and composed interval.

3,968,723

METHOD FOR RECLAIMING AND RECYCLING PLASTIC BONDED ENERGETIC MATERIAL

Charles W. Falterman, China Lake; Fred Menz, Ridgecrest; Wallace E. Silver, Ridgecrest, and Pearsie S. Wiggins, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,358

Int. Cl.[2] F42B *33/06;* C06B *25/34*

U.S. Cl. 86—1 A 9 Claims

1. A method for removing solid plastic-bonded high explosive material form a warhead casing without detonating said high explosive material comprising the steps of:

A. inserting, into a cavity in said solid plastic bonded high explosive material, a suitable length of detonating cord to partially fill the cavity;

B. substantially filling the remainder of the cavity with a suitable fluid; and

C. detonating the detonating cord.

3,968,724

METHOD FOR ACCURATELY VARYING THE DENSITY OF A POWDER OR POWDER CHARGE, AND SHRINK TUBES FOR USE THEREWITH

James F. Kowalick, Southampton; George F. Hare, Feasterville, both of Pa., and Harry J. Addison, Jr., Willingboro, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,830

Int. Cl.[2] F42B *3/00;* C06B *21/00*

U.S. Cl. 86—20 R 2 Claims

1. Method for controlling the density of an explosive powder and bringing said powder to a desired constant linear density powder charge comprising:

a. inserting said explosive powder into heat shrink tubing, said heat shrink tubing comprising a plurality of concentric pieces of heat shrink tubing,

b. sealing ends of said powder contained heat shrink tubing, and

c. heating said sealed heat shrink tubing to effect shrinkage of said tubing and radial compression of said explosive powder contained therewithin to a constant linear density powder charge.

3,968,725

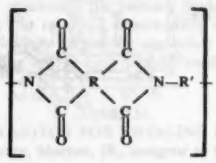
HIGH STRENGTH, LOW STRETCH BRAIDED ROPE

Henry J. Holzhauer, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa

Filed Dec. 13, 1974, Ser. No. 532,457
Int. Cl.² D04C 1/12
U.S. Cl. 87—6 4 Claims

1. Multi-filament line means comprising a blend of filaments braided together to form a composite line structure and including a core with a multi-filament sheath braided thereover;

a. said core comprising the combination of a first and a second plurality of filaments combined together with said first plurality of filaments consisting essentially of a polyolefin selected from the group consisting of polypropylene and polyethylene, and with said second plurality of filaments consisting essentially of polyimide of an aromatic tetracarboxylic acid dianhydride having the recurring unit with the structural formula:



wherein R is a tetravalent aromatic radical, and wherein R is a divalent benzenoid radical;

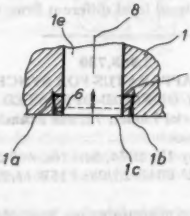
b. said sheath comprising a plurality of filaments braided together and consisting essentially of polypropylene.

3,968,726

CARTRIDGE RECEIVING DRUM CONSTRUCTION FOR GAS-TIGHT CLOSURE BETWEEN THE DRUM AND THE ADJACENT GUN BARREL

Oskar Grimm, Epfendorf; Ludwig Vorgrimler, Oberndorf, Neckar, and Peter Bernhard, Dietingen, all of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

Filed Sept. 12, 1974, Ser. No. 505,250
Claims priority, application Germany, Sept. 22, 1973, 2347855
Int. Cl.² F41D 7/04
U.S. Cl. 89—26 5 Claims



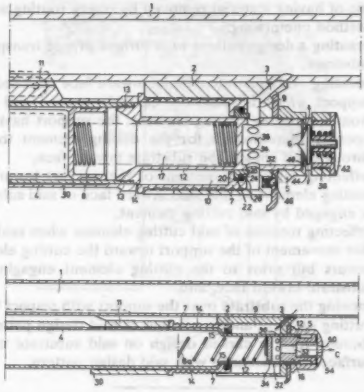
1. A cartridge receiving drum construction providing a gas-tight closure of a separation interstice between a gun barrel and a cartridge receiving drum mounted coaxially of the gun barrel for rotation in a gun housing, particularly for revolver guns with high ballistic performances and correspondingly designed ammunition, comprising a drum having at least one projectile guideway for receiving a cartridge which is alignable with the gun barrel and having a front surface facing the end of the gun barrel with a circular groove arranged concentrically of the projectile guideway of said drum, an elastic seal ring in said groove capable of withstanding very high temperature, and at least one small bore defined in said drum between the inner end of said groove and said projectile guideway opening in said guideway at a spaced location from the gun barrel facing end, said small diameter bore providing a passage for a partial stream of high pressure powder gases upon ignition of the cartridge which stream acts to deform the seal in said groove to cause it to seal one side of the groove and back the other side and wherein said groove has an outside diameter approximately 8% larger than the largest case diameter of a cartridge to be fired.

3,968,727

FIREARM WITH GAS-OPERABLE STRUCTURE AND RELIEF VALVE

Timo Hyytinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Apr. 26, 1974, Ser. No. 464,639
Claims priority, application Finland, Apr. 27, 1973, 1356/73
Int. Cl.² F41D 5/08, 5/10
U.S. Cl. 89—191 A 9 Claims



1. In a firearm, a barrel, gas cylinder means having an axis parallel to said barrel, said gas cylinder means being fixed to a lower portion of said barrel and communicating with the interior thereof for receiving gas under pressure upon firing of a round, elongated magazine means coaxial with said gas cylinder means and extending rearwardly therefrom beneath said barrel, guide means fixed to and forming a forward extension of said magazine means, said guide means extending coaxially into said gas cylinder means, gas piston means situated in said gas cylinder means for movement rearwardly therein when gas under pressure is received in said gas cylinder means, said gas piston means surrounding and being guided by said guide means and also being surrounded and guided by said gas cylinder means, automatically operable means operatively connected with said gas piston means to be operated automatically thereby when said gas piston means moves rearwardly in said cylinder means, gas-passage means communcating with spaces in said cylinder means situated before and behind said gas piston means for admitting some gas from the space before said gas piston means to the space behind the latter for braking the rearward movement of said

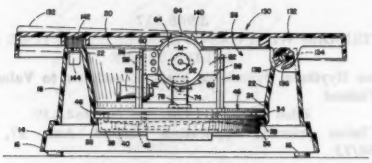
gas piston means, and relief valve means fixed to and forming a forward extension of said guide means, said relief valve means communicating on the one hand with the interior of said gas cylinder means forwardly of said gas piston means and on the other hand with the outer atmosphere for relieving excess pressure encountered in said gas cylinder means when gas under pressure is received therein.

3,968,728

CARVING TOOL

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Aug. 8, 1975, Ser. No. 602,997
Int. Cl.² B23C *3/00, 1/06*
U.S. Cl. 90—11 C **20 Claims**



1. A method of carving a design in a transparent substrate capable of having material removed by rotary routing action, said method comprising:

a. creating a design pattern on a surface of said transparent substrate,

b. locating said substrate with an inward face disposed on a support which is relatively movable toward and away from a rotatable cutting element, the support having an opening therethrough for the cutting element to pass through and engage the substrate inward face,

c. effecting relative movement of the support toward the cutting element so that said inward face of said substrate is engaged by said cutting element,

d. effecting rotation of said cutting element when said relative movement of the support toward the cutting element occurs but prior to the cutting element engaging the substrate inward face, and

e. moving the substrate over the support with respect to the cutting element and in relation to said design pattern to thereby form a carved design on said substrate inward surface in accordance with said design pattern.

3,968,729

FLUID-OPERATED APPARATUS EXHIBITING HYSTERESIS EFFECT

Kenneth P. Hansen, Enfield, and Dean H. Crombie, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,491
Int. Cl.² F15B *13/042*
U.S. Cl. 91—32 **5 Claims**

1. A fluid operated control apparatus for selecting output signals from a plurality of sources and exhibiting a predefined hysteresis effect in response to an input pressure signal comprising:

An input pressure signal, a housing having an internal bore with a passageway to receive the input pressure signal and direct the pressure signal into one end of the bore, and a pressure chamber at the opposite end of the bore;

first pressure source signal means communicating a first signal at a first pressure level to said bore;

second pressure source signal means communicating a second signal at a second pressure level to said bore;

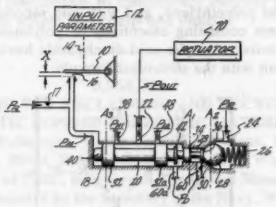
actuator means responsive to said first and second pressure source signals;

output means communicating said bore with said actuator means for conveying said first and second pressure source signals to said actuator means; and

a shuttle member mounted within the housing bore for sliding movement between a first and second position and having one end exposed to the input pressure signal received at said one end of the bore and an opposite end of a first predefined cross sectional area exposed to a pressure in the pressure chamber at said opposite end of the bore, said shuttle member having first and second land means thereon between said one end and said opposite end, one of said first and second land means communicating said first signal with said output means when said shuttle member is in said first position and the other of said first and second land means communicating said second signal with said output means when said shuttle member is in said second position;

means for continuously restrictively draining pressurized fluid from the pressure chamber; a regulated pressurized fluid;

valve means communicating with the pressure chamber for admitting the regulated pressurized fluid to the pressure



chamber and exposing said opposite end of the shuttle member to the pressurized fluid, the valve means including a valve seat having a second predefined cross sectional area, a biased closed valve element engaging the valve seat, and a movable valve member cooperating with the valve element to open the valve element and admit pressurized fluid into the pressure chamber, the valve member being connected with said opposite end of the shuttle member for movement between opened and closed positions of the valve element in response to pressure forces developed by the input pressure signal on said one end of the shuttle member, the second predefined cross sectional area of the valve seat and the first predefined cross sectional area of said opposite end of the shuttle member being selected relative to one another to move the shuttle member in one direction to one of said first and second positions and open the valve means at a first input pressure signal level and to move the shuttle member in the opposite direction to the other of said first and second positions and close the valve means in response to the pressurized fluid in the chamber at a second input pressure signal level different from the first level.

3,968,730

METHOD OF AND APPARATUS FOR SYNCHRONIZING A PLURALITY OF FLUID-OPERATED RAMS

Bernard Lucien Gabriel Lionet, 72, rue Francis de Pressense, Villeurbanne, France

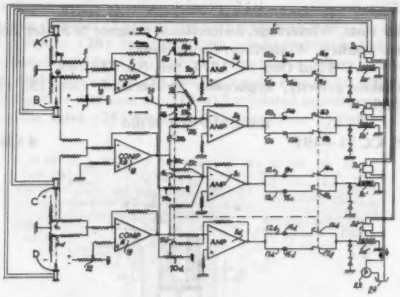
Filed May 13, 1974, Ser. No. 469,304
Int. Cl.² F01B *25/04*; F15B *11/22*
U.S. Cl. 91—171 **6 Claims**

1. A method of synchronizing at least three rams each controlled by a respective servovalve, said method comprising the steps of:

generating a respective analog position signal for each of said rams corresponding to the position thereof;

algebraically combining the position signal for a first of said rams with the position signal for a second of said rams and comparing the resulting combination with a reference signal to produce a first primary analog deviation signal and operating the first ram therewith;

algebraically combining the position signal for the second ram with the position signal for a third of said rams and



comparing the resulting combination with a reference signal to produce a second primary analog deviation signal and operating the third ram therewith; and

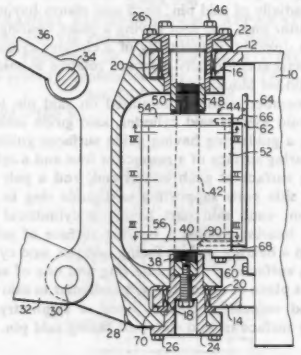
algebraically combining the primary deviation signals and comparing the resulting combination with a reference signal to produce an analog secondary deviation signal and operating said second ram therewith.

3,968,731

FLUID MOTOR FOR SWINGING BOOMS

Jimmy Dale Myers, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 6, 1975, Ser. No. 555,925
Int. Cl.² F15B *21/04, 15/22;* F01C *9/00*
U.S. Cl. 91—407 **4 Claims**



1. A fluid motor for a boom or the like, comprising:

a generally vertical shaft;

a hollow cylinder disposed concentrically about said shaft;

upper and lower end plates secured to and sealingly engaging opposite ends of said cylinder to define a motor chamber;

said motor chamber and said shaft being relatively rotatable;

a first vane within said motor chamber and secured to said shaft and sealingly engaging said cylinder and said end plates;

a second vane within said motor chamber and secured to at least one of said cylinder and said end plates and sealingly engaging said shaft;

a first set of ports opening into said chamber adjacent one side of said second vane, said first set including at least one port in each of said end plates;

first means establishing a continually open fluid flow path between the ports of said first set and adapted to be alternately connected to a fluid pressure source and a fluid drain;

a second set of ports opening into said chamber adjacent the other side of said second vane, said second set including at least one port in each of said end plates; and

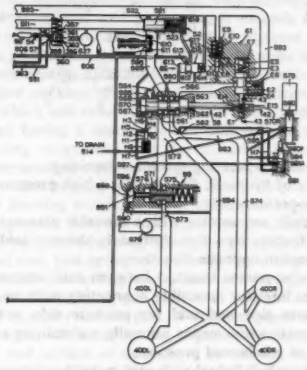
second means establishing a continually open fluid flow path between the ports of said second set and adapted to be alternately connected to the fluid pressure source and the fluid drain.

3,968,732

HYDRAULIC POWER TRANSMISSION SYSTEM

William Maurice Bard Fitzgerald, R.R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,725
Int. Cl.² F15B *11/16*
U.S. Cl. 91—414 **8 Claims**



1. A hydraulic power transmission system comprising:

first and second drive units each including one or more hydraulic motors;

conduit means connected to the motors for supplying working fluid thereto,

said conduit means further including a common return pipe connected to the motors for returning fluid therefrom;

a two-position valve in circuit with the motors of one said drive unit,

the motors of the other drive unit being supplied independently of said two-position valve,

said valve having a first operative position for blocking flow of working fluid to said one drive unit and a second operative position for permitting flow of working fluid to said one drive unit,

said valve being operable between its first and second positions for selective operation of one or both drive units;

a spring-loaded valve in circuit with the return pipe, the spring-loaded valve being displaceable from an open to a closed position to restrict fluid flow along the return pipe and so effect braking of the motors;

and a pressure-responsive valve means responsive to pressure in the return pipe for effecting displacement of the

two-position valve to the second operative position when said pressure exceeds a predetermined value.

3,968,733

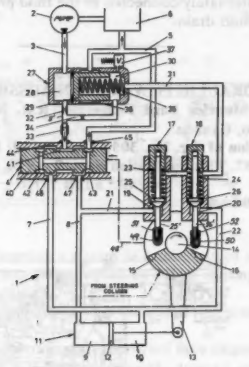
HYDRAULIC POWER-STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

Armin Lang, Schwabisch-Gmund-Bettringen; Falk Kurz, Schorndorf, and Wolfgang Walter, Schwabisch-Gmund, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed May 15, 1974, Ser. No. 470,046

Int. Cl.² F15B *11/08, 13/042*

U.S. Cl. 91—451 **9 Claims**



1. A vehicular steering system comprising:

a source of hydraulic fluid having a high-pressure side and a low-pressure side;

a hydraulic servomotor with a movable element and with two feeder lines for alternately driving said movable element in opposite directions;

main valve means inserted between said source and said feeder lines for reversibly connecting same to said high-pressure side and said low-pressure side, respectively, said main valve means normally maintaining said feeder lines at a balanced pressure;

a steering shaft linked with said movable element for bidirectional rotation thereby, said shaft being manually rotatable and being operatively coupled with said main valve means for shifting same, upon incipient manual rotation in a given direction, into a working position pressurizing one of said feeder lines and depressurizing the other of said feeder lines to displace said movable element in a sense aiding the rotation of said shaft in said given direction;

differential valve means including a cylinder and a spring-loaded piston dividing the interior of said cylinder into a first and a second compartment, said first compartment being connected to said high-pressure side, said cylinder having an outlet leading to said low-pressure side, said piston being urged by its spring force into a normal position blocking said outlet;

conduit means extending from said feeder lines to said second compartment, said conduit means including a pair of branch lines respectively connected to said feeder lines;

a pair of normally closed ancillary valves in said branch lines; and

actuating means mechanically coupled with said shaft for opening, upon said shaft approaching a terminal position while performing a hydraulically assisted rotation in said given direction, a respective ancillary valve in the branch line of the depressurized feeder line with resulting development of a pressure difference across said piston for moving the latter against its spring force into an off-normal position venting said high-pressure side to said outlet, thereby depressurizing the previously pressurized feeder line.

3,968,734

HYDROSTATIC PISTON MACHINE

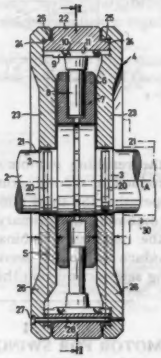
Peter Rutz, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 10, 1974, Ser. No. 513,749

Claims priority, application Switzerland, Oct. 15, 1973, 14585/73

Int. Cl.² F01B *13/06*

U.S. Cl. 91—491 **4 Claims**



1. A hydrostatic piston machine comprising

a pin;

a cylinder block rotatably mounted on said pin about an axis;

a plurality of pistons movably mounted in said cylinder block radially of said pin, each said piston having a foot at an outer end, said foot having a plane bearing surface thereon disposed tangentially of a circular cylinder having an axis eccentrically disposed relative to said axis of said cylinder block; and

a guide member rotatably mounted on said pin to rotate about said axis of said cylinder, said guide member including a guide ring having guide surfaces guiding each said bearing surface of a respective foot and a cylindrical bearing surface at each lateral end, and a pair of disc-shaped side parts supporting said guide ring in a radial direction, each said part having a cylindrical bearing surface bearing against a bearing surface of said guide ring and a bearing surface facing said pin, said cylindrical bearing surfaces of said guide ring and one of said parts having a plane of symmetry perpendicular to said cylinder axis and coincident with a plane of symmetry of said bearing surface of said side part facing said pin.

3,968,735

CONTROL DEVICE FOR A FLUIDIC-CONTROL JACK

Gilbert Boisde, Bures-sur-Yvette; Paul Cogez, Montrouge; Jean-Michel Lachenal, Ris Orangis, and Michel Lamare, Palaiseau, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 8, 1974, Ser. No. 449,528

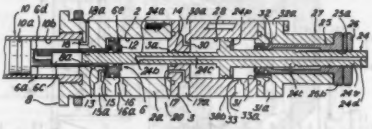
Claims priority, application France, Mar. 9, 1973, 73.08507

Int. Cl.² F01B *7/10*; F15B *15/24*

U.S. Cl. 92—13.8 **4 Claims**

1. A control device for a pneumatic double acting jack (20) for the operation of a proportioning pump comprising a main

piston (6), a hollow operating stem (6*a*) for said main piston extending from the jack (20) and moveable between extreme inner and outer positions, an auxiliary piston (24*p*) having inner and outer positions equal to those of said main piston (6), a piston extension (24*a*) connected to said auxiliary piston (24*p*) and sliding in said hollow operating stem (6*a*), a shaft (24*t*) connected to said auxiliary piston, a slide valve (25) surrounding said shaft (24*t*), means (25*a*) for adjusting the relative positions of said shaft (24*t*) and slide valve (25), a master cylinder (2) receiving said main piston (6), an auxiliary cylinder (28) receiving said auxiliary piston (24*p*), a distributor cylinder (27) opening into said auxiliary cylinder (28), said slide valve (25) sliding in said distributor cylinder (27) together with said shaft (24*t*) for limited movement when said slide valve (25) engages said distributor cylinder (27),



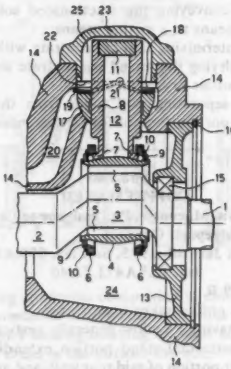
fixed and independent control ports (15, 17, 30, 31) for the passage of a motor fluid respectively disposed at the two extremities of said main cylinder (2) and of said auxiliary cylinder (28), a fluidic control port (6*e*) in said main piston (6) opening on said piston extension (24*a*), a port (24*b*) in said piston extension (24*a*) cooperating with said fluidic control port (6*e*), a fluidic control port (16) opening into said main cylinder (2) at a distance equal to the thickness of said main piston (6) from its outer position, a fluidic control port (33) opening into said auxiliary cylinder (28) at a distance equal to the thickness of said auxiliary piston (24*p*) from its inner position for moving said main piston (6) into its extreme inner position and a fluidic control port (32) in said distributor cylinder (27) opening into said auxiliary cylinder (28) and opened and closed by said slide valve (25) subject to said adjusting means (25*a*).

3,968,736

RADIAL FLUID-PRESSURE APPARATUS

Felice Pecorari, Via Zanoni, 62, Modena, Italy

Filed May 20, 1974, Ser. No. 471,781
Claims priority, application Italy, May 24, 1973, 40048/73
Int. Cl.² F16J 15/18
U.S. Cl. 92—165 R **9 Claims**



1. In a radial type of fluid-pressure apparatus, rotary crankshaft means and support means supporting said rotary crankshaft means for rotation about its axis, said rotary crankshaft means having a crankpin spaced radially from its axis of rotation, a piston extending outwardly away from said crankpin and having an inner end region adjacent said crankpin, connecting means connecting said inner end region of said piston to said crankpin for transmitting motion between said piston and crankpin, outer housing means surrounding said axis and having an outer wall portion and an inner surface region defining a chamber into which an outer end region of said piston extends, fluid passage means communicating with said chamber, inner housing means surrounded by said outer housing means and situated between the latter and said axis with said inner housing means also surrounding said axis, said inner housing means being formed with a seat surrounding said piston and forming part of a sphere, a sleeve having an inner cylindrical surface surrounding and slidably engaging an exterior cylindrical surface of said piston with the latter extending through said sleeve, said sleeve having an outer surface forming part of a sphere of the same diameter as the sphere of which said seat forms a part and said sleeve being seated on said seat, and spring means urging said sleeve into engagement with said seat for maintaining a fluid-tight slidable engagement of said sleeve with said seat so that while said piston moves outwardly away from or inwardly toward said axis said sleeve can rock at said seat while remaining in fluid-tight engagement therewith, said piston approaching closely to said outer wall portion of said outer housing means during said movement of said piston outwardly away from said axis and said inner surface region of said outer housing means which defines said chamber surrounding and extending longitudinally along a substantial portion of said piston which extends from said outer end region therof and being located adjacent the latter substantial portion of said piston while at the same time being spaced therefrom by a distance sufficient to provide for free, unobstructed rocking of said piston in said chamber, said sphere of which said outer surface of said sleeve and said seat form a part having a center situated outwardly beyond said inner housing means and said sleeve having an outer end surface surrounding said piston and situated between said inner and outer housing means while being directed toward said outer housing means, said spring means engaging and being compressed between said outer end surface of said sleeve and said outer housing means for pressing said sleeve against said seat, said spring means including a ring of elastic sheet material surrounding said piston and having an inner surface part of which engages said outer end surface of said sleeve and an outer surface part of which engages said outer housing means, the latter having adjacent but spaced from said outer end surface of said sleeve an annular surface directed inwardly toward said outer end surface of said sleeve and being of the same diameter as said ring of elastic sheet material and engaged by said outer surface part thereof so that said ring of elastic sheet material is situated in its entirety adjacent said sleeve distant from said outer wall portion of said outer housing means.

3,968,737

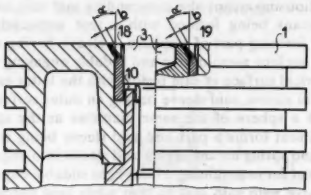
DISJOINABLE ASSEMBLY DESIGNED FOR CONNECTING OF PISTON WITH PISTON ROD IN ENGINES AND MACHINES, PARTICULARLY SUITABLE FOR USE IN COMPRESSORS

Stanislaw Kulig, Krakow, Poland, assignor to Osrodek Badawczo-Rozwojewy Przemyslu Budowy Urzadzen Chemicznych "Cebea", Krakow, Poland

Filed Mar. 13, 1975, Ser. No. 558,114
Claims priority, application Poland, Apr. 5, 1974, 170132
Int. Cl.² F16J 1/12
U.S. Cl. 92—258 **6 Claims**

1. The combination of a piston and piston rod with a demountable assembly connecting the piston and piston rod, said piston having an end face with a recess therein and at least one socket extending from said recess, a tubular insert in said recess and abutting an axially facing wall thereof, a connector in said insert and in engagement with a portion thereof,

said piston rod abutting an axially facing portion of said piston and means engaging said connector with said piston rod, said insert and piston rod including means defining a splined connection therebetween, said insert having an upper portion which is thinner than its lower portion, said upper portion forming a single, axially extending thin rim which includes portions bent laterally, said rim having an outer diameter less than the outer diameter of the lower portion of the insert



connected thereto and an inner diameter greater than the inner diameter of the lower portion of the insert connected thereto; said connector having at least one socket therein, one portion of said rim being being bent outwardly into the socket in said piston and a second portion being bent inwardly into the socket in said connector to secure the connector against rotation, said rim initially forming free spaces with said connector and piston to permit bending the rim into said sockets after installation of the insert into said recess.

3,968,738

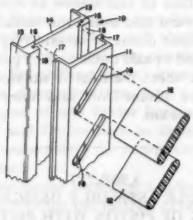
PLASTIC LOUVER FRAME ASSEMBLY

William A. Matzke, Mahopac, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 464,915, April 29, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,060

Int. Cl.[2] F24F *13/06*

U.S. Cl. 98—108 **3 Claims**



1. A plastic louver frame assembly comprising: an external frame assembly comprising top, bottom, and side external frame sections for fitting into an opening in a wall, including two inwardly extending turned-over rails forming vertical grooves in the side external frame sections; two vertical retaining frames, each formed with outwardly extending members which are slidably received into the grooves in the side external frame sections and are formed with a U-shaped channel defining an enclosed air space, each retaining frame formed with angular slots closed at each end; and a series of plastic louver strips positioned in the angular slots in the retaining frames, and held against movement by the slot ends.

3,968,739

APPARATUS FOR THE PROCESSING OF VINASSE

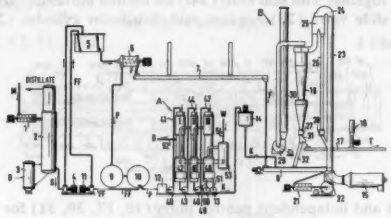
Hans-Martin Stoltenburg, Selk, Germany, assignor to Kartoffelverwertungsgesellschaft Cordes & Stoltenburg, Schleswig, Germany

Division of Ser. No. 459,276, April 9, 1974. This application Dec. 23, 1974, Ser. No. 535,579

Claims priority, application Germany, Apr. 13, 1973, 2318751

Int. Cl.[2] C12F *3/10*

U.S. Cl. 99—276 **6 Claims**



1. Apparatus for processing vinasse comprising:
a. means for crushing large solids of a fermented mash whereby the dangers of heat crusting and clogging are reduced to a minimum;
b. means for distilling the crushed solids to obtain a bottoms residue of vinasse;
c. means for indirect heating of the distilling means;
d. decanting means for fractionating the vinasse to simultaneously convert the vinasse into clear liquid with a very minimal content of undissolved fine grained solids, and solids with a high degree of dehydration, and removing the solids therefrom;
e. means for exiting the clear fractionated liquid from the decanter;
f. buffer tank means for receiving free-fall the clear fractionated liquid from the decanter, and separating sediment therefrom;
g. means for recycling the aforesaid sediment to the decanter;
h. multiple effect vacuum downfall vaporizing means to thicken the clear fractionated liquid, and form a concentrate thereof;
i. means for conveying the fractionated solids from the decanting means to a mixing means;
j. means for intermixing said concentrate with said solids;
k. means for drying the mixed concentrate and solids by a two-stage hot-air drying means;
l. means for separating said solids from the mixer, and returning a portion thereof for further mixing.

3,968,740

COFFEEMAKER

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

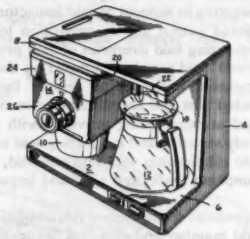
Filed July 28, 1975, Ser. No. 599,411

Int. Cl.[2] A47J *31/40*

U.S. Cl. 99—289 R **7 Claims**

1. An electric coffeemaker comprising:
a. a housing having a hollow generally vertical rear wall, a generally horizontal stand portion extending outwardly from a lower portion of said rear wall, and an overhanging wall extending outwardly from an upper portion of the vertical rear wall;
b. a ground coffee dispenser positioned on said generally vertical wall a substantial distance above the lower stand portion of said housing;

c. a carafe for brewed coffee positioned on the lower stand portion of said housing at one side of said ground coffee dispenser and under said overhanging wall;
d. means for discharging heated water through an outlet which is provided in the overhanging wall of said housing above said carafe;
e. a ground coffee basket having an outwardly extending lip at its upper portion;
f. a supporting guide rail means formed at a lower portion of said ground coffee dispenser for receiving the lip portion of said coffee basket to removably support said coffee basket below said ground coffee dispenser; and



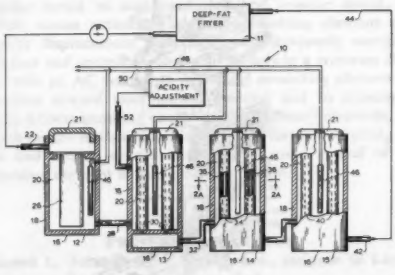
g. a supporting guide rail means provided in the overhanging top wall of said housing above said carafe and at one side of said ground coffee dispenser for receiving the lip portion of said coffee basket to removably support said coffee basket on the top wall of said housing above said carafe so that said ground coffee basket may be first positioned on the guide rail means below said coffee dispenser to receive ground coffee, and then positioned on the guide rail means provided in the top wall of the housing to receive heated water from said heated water outlet.

3,968,741

COOKING OIL RECOVERY SYSTEM

Arthur John Hunt, 332 N. Halifax Drive, Ormond Beach, Fla. 32074

Continuation-in-part of Ser. No. 266,222, June 26, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,256
Int. Cl.[2] A47J *37/12*
U.S. Cl. 99—330 **5 Claims**



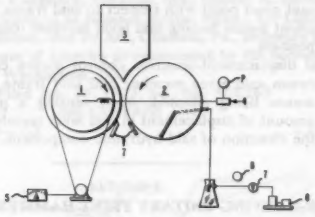
1. A cooking apparatus comprising in combination:
a cooking container having container walls and a bottom for holding and heating cooking oil, said cooking container having a drain in the bottom thereof;
a plurality of filtering elements connected in series for filtering cooking oil passing therethrough;
a drain line connecting the first filter element in said series to said cooking container drain;
a return line operatively connecting the last of said series of filter elements to said cooking container;
pump means operatively connected to said cooking apparatus to pump cooking oil from said cooking container through said drain line, filtering elements and through said return line back into said cooking container, the return line being connected to said cooking container through one wall adjacent a second wall thereby causing a circular movement of oil around said cooking container;
drain line heating means attached to said drain line to heat said oil passing thereby;
filter heating means attached around at least one filtering element for heating oil passing therethrough;
acid reducing metering means operatively connected between said drain line and said return line for metering acid to said cooking oil; and
ph measuring means for measuring the ph of cooking oil and being operatively connected to said acid reducing metering means for activating said acid reducing metering means when said ph reaches to a predetermined level.

3,968,742

PROCESS FOR THE CONCENTRATION OF PIGMENT PRESS CAKE

John Hammond Kerr, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1974, Ser. No. 493,070
Int. Cl.[2] B30B *9/20*
U.S. Cl. 100—37 **6 Claims**



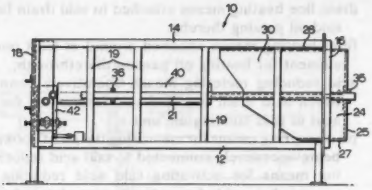
1. In a process for using an apparatus which apparatus comprises a pair of rotatable, perforated rolls; means connected to said rolls for rotating said rolls in opposite directions such that the top of each roll rotates toward a plane located between the rolls and said plane being perpendicular to a plane through the center axes of said rolls; means connected to said rolls for adjusting the distance between the rolls; means for feeding pigment press cake between the rolls such that when the rolls are rotated, the press cake is drawn between the rolls; means connected to said rolls for applying vacuum to the interior of the rolls; means connected to said rolls for removing the pigment press cake from the rolls; the improvement comprising using said apparatus, wherein the rolls are circumferentially grooved, mounted horizontally with respect to one another and covered with a porous covering so that only water and dissolved solids can pass through the covering, for performing the process comprising:
a. feeding the pigment press cake between the rolls of said apparatus,
b. adjusting the distance between the rolls to provide compression and shear on the pigment press cake,
c. applying a vacuum to the interior of the rolls sufficient to cause excess water which is squeezed from the pigment press cake to be drawn into the rolls and eliminated, and
d. removing the pigment press cake from the rolls.

3,968,743

REFUSE PACKER

John J. Scherrer, Elmira, Canada, assignor to B & L Metal Products (Elmira) Limited, Elmira, Canada

Filed May 19, 1975, Ser. No. 578,731
Claims priority, application United Kingdom, May 22, 1974, 22917/74
Int. Cl.² B30B 15/16
U.S. Cl. 100—52 6 Claims



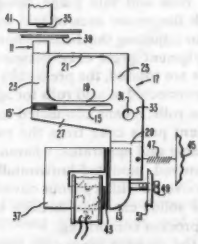
1. In combination:
a frame which includes substantially rectilinear track means,
a force-exerting member adapted to reciprocate along said track means,
a lever member pivoted to said frame about a pivot point,
a hydraulic component adapted positively to urge said force-exerting member along said track means, part of said hydraulic component being operatively connected to said force-exerting means, another part thereof being operatively connected to said lever member at a location such that activation of said hydraulic component applies torque to said lever member tending to rotate it about said pivot point with respect to said frame,
resilient means biasing said lever member toward an at-rest position,
and displacement-sensitive control means connected between said lever member and said frame, said control means being adapted, upon sensing a predetermined amount of displacement in said lever member, to reverse the direction of said hydraulic component.

3,968,744

SELF-DAMPING UNITARY PRINT HAMMER FOR HIGH SPEED PRINTERS

Abdul L. Kasu, Westland, and William J. Basse, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 3, 1975, Ser. No. 554,579
Int. Cl.² B41J 9/42
U.S. Cl. 101—93.02 9 Claims



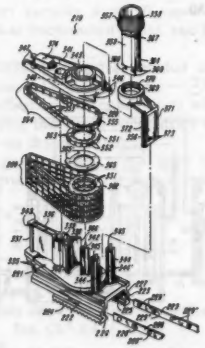
1. A self-contained print hammer for rotatable impacting use in association with a solenoid and a print station in a line printer, said print hammer being rotatably effective for producing a printed output in said print station and for preventing an overprint of said printed output, said self-contained print hammer comprising:
a. an actuator formed of a metallic material and operatively associated with said solenoid,
b. an impactor formed of a metallic material and effective for producing said printed output in said print station,
c. thermoplastic body means comprising:
first and second spaced apart flexure members interconnected at corresponding ends thereof by an interconnecting member, said interconnecting member having a recess constrictively securing and supporting said impactor,
a first rigid member disposed in parallel and predetermined spaced relationship with said first flexure member on the side thereof opposite said second flexure member and said impactor, said first rigid member operating in support of said impactor in producing said printed output and in opposition to said impactor in preventing said overprint of said printed output, and
a second rigid member disposed on the side of said thermoplastic body means remote from said interconnected first and second flexure members, said second rigid member being provided with a recess constrictively securing and supporting said actuator in cooperable relationship with said solenoid, and
d. a dampener associated with said impactor and comprising:
said predetermined spaced relationship between said first rigid member and said first flexure member, and
a damping material fixed to said first rigid member on the surface thereof adjacent said first flexure member, whereby upon the production of said printed output in said print station the kinetic energy generated in said impactor and in said interconnected first and second flexure members is absorbed by the contraction of the spaced distance comprising said predetermined spaced relationship between said first rigid member and said first flexure member and by the damping compression of said damping material.

3,968,745

LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,454
Int. Cl.² B41J 1/20, 1/24
U.S. Cl. 101—111 28 Claims



1. Printing apparatus, comprising: a series of flexible printing bands, a drive wheel in driving engagement with each respective printing band, each drive wheel having a hole, the holes being generally aligned to provide an opening, a selectively shiftable and rotatable selector movable into the opening, means formed partly by the selector and partly by the

wheels for selectively drivingly coupling the selector and a selected one of the wheels at a selected position to effect rotative setting of the selected wheel upon rotation of the selector, and means formed partly by the selector and partly by at least one wheel and disposed in the opening for releasably holding the selector in the selected shifted position irrespective of the position to which the selector is shifted.

3,968,746

AUTOMATIC DEVICE FOR THE REMOTE ADJUSTMENT OF THE INKING BLADE OF A PRINTING MACHINE

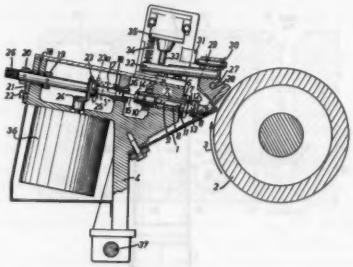
Jean R. Gaillochet, Paris, France, assignor to Marinoni, Paris, France

Filed Sept. 18, 1970, Ser. No. 73,319

Claims priority, application France, Nov. 12, 1969, 69.38854

Int. Cl.² B41F *31/04*

U.S. Cl. 101—365 **4 Claims**



1. An inking device for printing machines comprising an ink fountain, means for creating a flow of ink from said ink fountain, means for adjusting said flow of ink including a rotationally adjustable ink control element and a first electrically reversible synchronous motor, means for drivably connecting said synchronous motor with said ink control element to effect adjustment thereof at a predetermined angular speed, a control device comprising a presetting element manually rotatable through various angular displacements in either of two directions from a neutral position, a second electrically reversible synchronous motor drivably connected to said presetting element to drive said presetting element rotationally from said various displacements to said neutral position at the same angular speed as said predetermined angular speed, and switch means actuatable by said presetting element upon angular displacement thereof for simultaneously energizing said first and second synchronous motors in a common direction with an AC voltage to drive said presetting element in a direction toward said neutral position and to rotationally adjust a corresponding one of said ink control elements, said switch means further comprising means for de-energizing said first and second synchronous motors upon arrival of said presetting element at said neutral position.

3,968,747

PRINTING APPARATUS

Leonard L. Johnson, Fort Wayne, Ind., assignor to Lincoln Logotype Co., Inc., Fort Wayne, Ind.

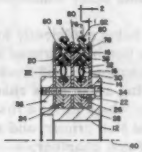
Filed Jan. 27, 1975, Ser. No. 543,991

Int. Cl.² B41F *13/10*

U.S. Cl. 101—376 **23 Claims**

1. Printing apparatus comprising a wheel having two spaced sides, a support member mounted between said sides for radial movement, means for limiting the outward radial travel of said member, said wheel being open radially outwardly from said support member, a spring of resilient, rubber-like material, in buckled columnar form extending radially of said wheel between said support member in its outermost radial position and the central portion of said wheel,

said buckled columnar spring being secured at its radially outer end to said support member and at its inner end to said central portion of said wheel whereby radially inward movement of said support member causes lateral bowing



of said spring with the force exerted by the spring in opposition to the radially inward movement remaining nearly constant over the range of support member radial movement, and type-supporting means including said support member and wheel sides for supporting a type segment in said open portion of said wheel.

3,968,748

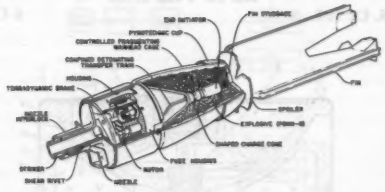
TARGET DISCRIMINATING BOMBLET

Milton K. Burford, China Lake; Joseph F. Mattis, Ridgecrest, both of Calif.; Peter D. Gratton, Simpsonville; William J. Donahue, Takoma Park, both of Md.; Michael A. Halling, San Diego; Ken Pinkerton, Westminster, both of Calif.; Thomas A. Cammack, Beltsville, Md.; Rodney A. Bernardin, Wayzota, Minn.; Lee Johnson, Edina, Minn.; Art Lohmann, Hopkins, Minn., and Ed Abt, Chalfont, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 15, 1973, Ser. No. 329,263

Int. Cl.² F42B *25/16*

U.S. Cl. 102—7.2 **2 Claims**



1. A target discriminating bomblet for distinguishing between hard and soft targets, comprising:

a warhead, having

an ogive-shaped fragmentation case; a conical shaped charge liner mounted within said case; an explosive load located in said case between said case and said liner; and

a zirconium cup circumferentially attached to said case; and a fuse, having

a stab detonator;

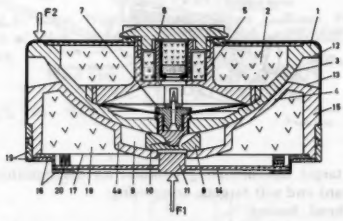
an explosive transfer line, one end of which is adjacent to said detonator and the other end of which is attached to a booster charge located within said warhead;

a first firing pin located adjacent to said detonator when the bomblet is armed;

a first cylindrical body held closely within a second cylindrical body forming a part of a housing for said fuze and relative axial movement between said two cylindrical bodies being prevented by at least one shear rivet passing through walls of said bodies;

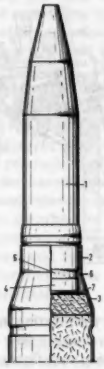
a stab primer;
a second firing pin having a pointed and a non-pointed end, said pin located adjacent to said primer when the bomblet is armed;
expulsion means for propelling the bomblet warhead into the air after the bomblet has impacted a soft target;
a first pyrotechnic delay connecting said primer with said expulsion means for igniting said expulsion means;
a second pyrotechnic delay connecting said primer with said detonator;
said second delay being sufficiently longer than said first delay so that the bomblet warhead is propelled into the air prior to detonation of said warhead;
said housing defining a ball mass chamber having a centering receptacle which forms a first end of said chamber opposite said stab primer, and said primer forming a second end of said chamber;
a metal ball-shaped inertial mass poised to inertially plunge said second firing pin into said primer upon a sudden deceleration of the bomblet, said ball mass being contained within said chamber;
a hemispherical cup attached to said non-pointed end of said second firing pin and holding said ball-shaped mass within said cup; and
resilient means for urging said cup and said second firing pin away from said primer and toward said centering receptacle;
so arranged and constructed that the bomblet striking a soft target will fail to activate said first firing pin and will activate said second firing pin to initiate said expulsion means for propelling the bomblet warhead into the air where said warhead is detonated, and so that the bomblet exhibits pyrophoric properties upon detonation.

3,968,749
LAND MINE
Karl Olof Bertil Malm, Stockholm, Sweden, assignor to AB Bofors, Bofors, Sweden
Filed May 16, 1974, Ser. No. 470,508
Claims priority, application Sweden, May 22, 1973, 7307161
Int. Cl.² F42B *23/26*
U.S. Cl. 102—8 **6 Claims**



1. A land mine comprising two relatively movable parts, one of said parts having a spherical contact surface which is supported in and slidably engages a complementary bowl-shaped contact surface in the second part, said parts being adapted to be tangentially displaced relative to one another at their respective contact surfaces upon application of an external force to one of said parts, a percussion mechanism, an actuating device selectively responsive to said tangential displacement of said parts at their respective contact surfaces for activating said percussion mechanism, said actuating device comprising a member located in a space between said contact surfaces, and locking means adjacent said member responsive to the presence of a further external force for selectively locking said member in fixed position relative to said second part so that, upon occurrence of said tangential displacement of said parts at their respective contact surfaces, relative movement occurs between said member and said first part to cause said member to activate said percussion mechanism, said locking means being responsive to the absence of said further external force for unlocking said member from said second part to permit said member to follow the movement of said first part within said space upon occurrence of said tangential displacement thereby to prevent the activation of said percussion mechanism.

3,968,750
PROJECTILE-CASE CONNECTION
Antonius Maria Deelen, Schijndel, Netherlands, assignor to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V., 's-Hertogenbosch, Netherlands
Continuation-in-part of Ser. No. 342,988, March 20, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,286
Int. Cl.² F42B *9/20*
U.S. Cl. 102—41 **1 Claim**



1. In ammunition, in particular disintegrating practice ammunition for artillery pieces having a high rate of fire, comprising in combination a projectile having a relatively soft deformable plastic material shell having an end portion formed with at least one annular recess therein, a cartridge case open at one end and receiving said end portion, said case having a conical part extending rearwardly and surrounding said annular recess, and means for securing the shell to said cartridge case comprising hardened, molded material filling the space between said recess and said conical part.

3,968,751
ARMING DEVICE
Robert G. Palifka, Orford, N.H., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 5, 1975, Ser. No. 610,601
Int. Cl.² F42C *5/00*
U.S. Cl. 102—76 R **3 Claims**

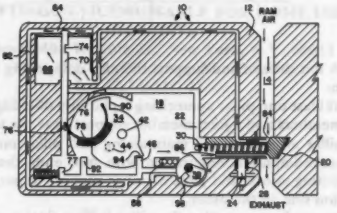
1. In a control mechanism including:
environmental sensing means having an energy output;
actuation initiation means;
time delay means;
first, second and third cam means movable from an initial position to a final actuation position;
plunger means coacting with said cam means and movable from an initial position blocking movement of said third cam means;
said first cam means being driven under control of said time delay means from an initial position blocking movement of said plunger means to an actuation position allowing finite travel of said plunger means;

said second cam means being driven by energy developed by said environmental sensing means from an initial position blocking movement of said plunger means to an actuation position allowing full travel of said plunger means;

said third cam means carrying said actuation initiation means and being connected to said second cam means through an energy storage means;

said plunger means blocking movement of said third cam means until energy has been stored in said energy storage means;

whereby, when said first and second cam means move into the actuated position, said plunger means will move into a position unlocking said third cam means and allowing said third cam means to move into the actuation initiation position; the improvement comprising:



said energy storage means connecting said second and third cam means consisting of a compression spring having a predetermined threshold level response and supplying a constant force over the displacement range of said second cam means;

whereby energy is stored in said spring upon movement of said second cam means in response to said environmental sensing means; and

said force being sufficient to move said third cam means when unlocked to actuation initiation position; or

to move said second cam means back into a position locking said plunger means when said energy developed by said environmental sensing means falls below a predetermined value.

3,968,752

MOBILE TRACK WORKING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H., Vienna, Austria

Filed Feb. 18, 1975, Ser. No. 550,751

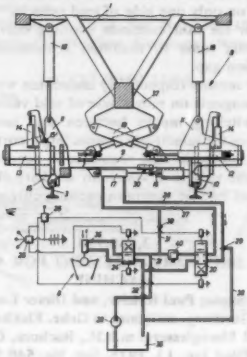
Claims priority, application Austria, Sept. 27, 1974, 7794/74

Int. Cl.² E01B *27/17, 29/04*

U.S. Cl. 104—7 B **12 Claims**

1. In a mobile apparatus for working on a track including two rails fastened to ties, which comprises a track lining and leveling unit having a frame mounted for mobility on the track rails, hydraulic drive means for moving the frame in mutually perpendicular directions extending transversely and vertically to the track for lining and leveling the track, flanged lining rollers mounted on the frame for engagement with an associated one of the rails, and poweractuated rail lifting hooks mounted on the frame and arranged to subtend the rails, the improvement of

1. adjustment drive means for continuously and simultaneously moving the lining rollers into substantially play-free engagement with the associated rails, and



2. a control for the adjustment drive means for temporarily holding the lining rollers in a fixed relation to the frame.

3,968,753

CIRCUIT ARRANGEMENT FOR MAGNETIC SUSPENSION VEHICLE SYSTEMS

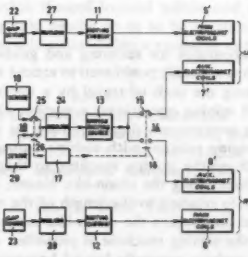
Ulrich Breitling, Berlin, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Feb. 19, 1975, Ser. No. 551,054

Claims priority, application Germany, Feb. 20, 1974, 2408071

Int. Cl.² B61B *13/08*

U.S. Cl. 104—148 MS **8 Claims**



1. An electromagnetic suspension vehicle system comprising:

a track having a pair of main armature rails on opposite sides thereof, a switch portion in which at least one of said main armature rails is interrupted, and a pair of auxiliary armature rails at least at selected locations of said switch portion;

a vehicle displaceable along said track and having at opposite sides thereof respective main electromagnets respectively cooperating with said main armature rail, and auxiliary electromagnets cooperating with said auxiliary armature rails at least at selected regions of said switch portion for suspending said vehicle on said track in the absence of suspension force from an associated main electromagnet;

separate exciting current sources for each of said main electromagnets;

a common exciting current source for both said auxiliary electromagnets on opposite sides of said vehicle;

switching means for selectively connecting said common exciting current source with a selected auxiliary electromagnet on only one side of said vehicle;

a regulator for said common exciting current source for controlling same to maintain a substantially constant suspension gap;

respective sensors respectively associated with the auxiliary electromagnets on either side of said vehicle; and

second switching means between said sensors and said regulators for selectively connecting a corresponding one of said sensors to said regulator in accordance with the side of the vehicle at which an auxiliary electromagnet is energized by said common exciting current source.

3,968,754
CHAIN DRIVE ARRANGEMENT FOR A MINING MACHINE

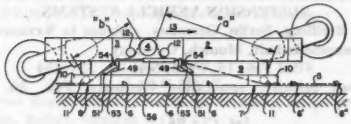
Willy Lanfermann; Paul Kaisler, and Dieter Lauterbach, all of Bochum, Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Jan. 13, 1975, Ser. No. 540,556

Claims priority, application Germany, Jan. 11, 1974, 24011981

Int. Cl.² B61B 13/00

U.S. Cl. 104—172 R **29 Claims**



1. In an apparatus for securing and guiding a chain-like means which is normally positioned to extend in a longitudinal direction along the path of travel by a mining machine for underground mining operations, a portion of the chain-like means being continuously displaced from its normal position into an engaging relation with a drive output member of a driven winch on the mining machine to thereby propel the mining machine along the chain-like means, guide members spaced apart in relation to the length of the mining machine to retain and then return the chain-like means to the normal position as the mining machine is propelled along such that the guide members generally bound between them the displaced portion of the chain-like means for engagement with the drive output member, the improvement comprising:

holding means engaging said chain-like means at spaced-apart intervals to restrain the chain-like means along the length thereof, each holding means resisting the tension load imposed upon the length of chain-like means lying ahead of the mining machine in relation to the propelled movement thereof by the driven winch on the mining machine; and

guide means distinct from said guide members and spaced apart in relation to the length of said mining machine at opposite sides of said drive output member to releasably retain said chain-like means by successive ones of said holding means until displacement of the chain-like means toward the drive output member and to engage again the released chain-like means passed from the drive output member with the holding means as the mining machine is propelled along said chain-like means.

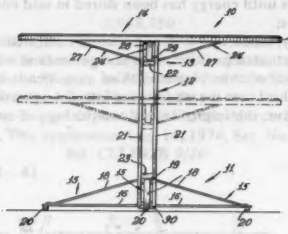
3,968,755
TABLE AND BENCH CONSTRUCTION AND METHOD FOR FORMING SAME

Fritz O. Lester, Kalamazoo, Mich., assignor to Leane E. Lester, Kalamazoo, Mich.

Filed Nov. 28, 1973, Ser. No. 419,675

Int. Cl.² A47B 13/02

U.S. Cl. 108—150 **20 Claims**



1. A flat surface and support therefor comprising in combination:

1. at least one pillar comprising a plurality of elongate pillar members and a joint member support near the top of said pillar affixed to and maintaining said pillar members in spaced-apart configuration with free ends thereof projecting above said joint member support in parallel relation one to the other,

2. means for supporting the pillar in a vertical position to a horizontal surface,

3. a flat surface support comprising a joint member adapted to rest on said joint member support and to be engaged by the free ends of said pillar members and a plurality of supporting arms affixed to and projecting from said joint member having horizontal portions, and

4. a flat surface supported by the horizontal portions of said arms.

3,968,756
METHOD FOR INCINERATION OF A SLUDGE CONTAINING CHROMIUM SUBSTANCE AND APPARATUS THEREFOR

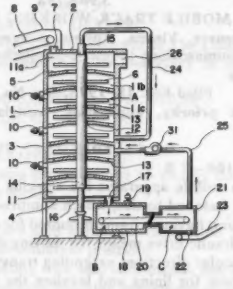
Shintaro Yamada, Toyanaka, Japan, assignor to Chugairo Kogyo Kaisha Ltd., Osaka, Japan

Filed Aug. 19, 1975, Ser. No. 605,927

Claims priority, application Japan, Aug. 20, 1974, 49-95629

Int. Cl.² F23G 7/00

U.S. Cl. 110—12 **10 Claims**



1. A method for incineration of a sludge containing chromium substance comprising a sequential combination of a step of incinerating the sludge containing chromium substance into ashes, a step of reducing hexad chromium existing within the

resultant of the first step into triad chromium by means of reducing gas, and a step of cooling the resultant of the second step before discharging the same to the outside.

5. An apparatus for incineration of a sludge containing chromium substance comprising in combination of a zone for incineration of the sludge containing chromium substance into ashes, the sludge being supplied from the outside into the incineration zone, a zone for reduction of the resultant of the incineration zone by means of reducing gas, the reduction zone being connected with the incineration zone to receive the resultant from the incineration zone, and a zone for cooling the resultant of the reduction zone, the cooling zone being connected with the reduction zone to receive the resultant from the reduction zone and with the outside to discharge the resultant of the cooling zone.

3,968,757
RUG-TUFTING DEVICE SUITABLE FOR HOME USE BY HOBYISTS

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

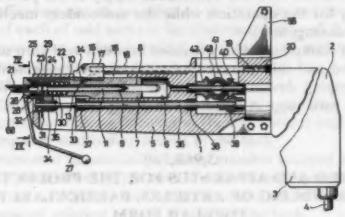
Filed Oct. 31, 1975, Ser. No. 627,668
Int. Cl.² D03C 15/06
U.S. Cl. 112—80 5 Claims

1. A hand-operated rug-tufting device comprising:
an axially extending elongated, and substantially hollow housing having a needle drive handle at the axially back end and a forward portion having a forwardly opening and axially extending looper holder slot and a forwardly opening and axially extending needle holder slot;
an elongated, axially extending looper holder received within the looper holder slot of the housing for reciprocating axial movement therein with respect to the housing;
an elongated, axially extending looper secured to the looper holder at a selected axial position with respect thereto and extending forwardly of the axially forward end of the looper holder;
a looper drive handle secured to the axially back end of the looper holder at a selected axial position with respect thereto and extending transversely away from the housing;
an elongated, axially extending needle holder received within the needle holder slot of the housing for axial movement therein with respect to the housing;
means for securing the needle holder to the housing at a selected axial position with respect thereto;
an elongated, axially extending needle secured to the needle holder and extending axially forwardly therefrom; and
said housing having a back stop and a forward stop disposed in the reciprocating axial path of the combination of the looper holder and the looper drive handle to limit the respective forward and back movement of said combination.

3,968,758
ARRANGEMENT FOR THE TUFTING OF CARPETS

Hartmut Scholz, No. 10 Wolfsteiner Strasse, D-8501 Allersberg, Germany

Filed Nov. 1, 1974, Ser. No. 520,119
Claims priority, application Germany, Nov. 13, 1973, 2356585
Int. Cl.² D05C 15/06
U.S. Cl. 112—80 11 Claims

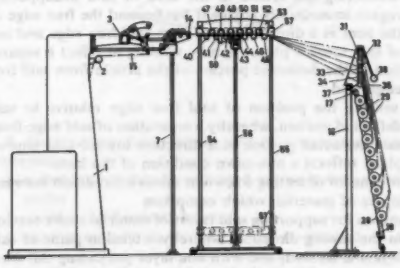


1. In an arrangement for the tufting of carpets during needleworking, including a hollow needle having an axial passageway and adapted to penetrate through the backing fabric of said carpet; a piston, means mounting said hollow needle for axial reciprocation within said piston; means for transporting the tufting thread through said needle in an airstream, said needle including an air inlet aperture for the sideways infeed of said air stream; a thread infeed aperture for the sideways infeed of said thread into said needle, said air inlet aperture being behind said thread infeed aperture in the direction of conveyance of said thread through said needle; a cutter for severing the thread in said needle passageway in timed sequence; and a common synchronously operating drive for effecting cutter movement and needle lifting motion, the improvement comprising; said air inlet aperture and said thread infeed aperture communicating with the interior of said hollow needle at separate locations, said hollow needle having the forward portion thereof located within said piston, and means mounting said needle so as to be rotatable about its longitudinal axis, said cutter being a rotatable cutter.

3,968,759
AUTOMATIC YARN CHANGER

Rudolf Reich, 6, An der Ringstrasse, Neuwied, Germany

Filed Oct. 15, 1974, Ser. No. 514,531
Claims priority, application Germany, Oct. 18, 1973, 2352207
Int. Cl.² D05C 3/04
U.S. Cl. 112—83 11 Claims



1. An arrangement for an embroidery machine having a needle side and in which the yarn ends to be fed at said needle side are to be changed, comprising:

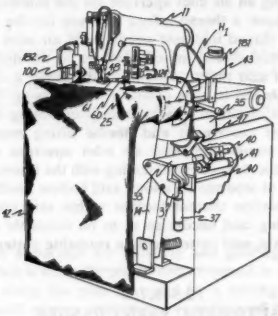
a replaceable yarn support stand;
a plurality of feed yarn rolls for the needle yarns required by the operations of said machine, said yarns being arranged in a close yarn group;
a movable yarn storage and tensioning arrangement separate from the embroidery machine adapted to withdraw an amount of yarn from said feed yarn rolls required for changing the yarn, and to accommodate the needle yarns from the feed yarn rolls with the same yarn lengths and for tension free and continuous supply of the yarn necessary for the operation while the embroidery mechanism is running; and
a yarn clamping device provided between said yarn support stand and said storage and tensioning arrangement, said clamping device clamping the resting feed yarn rolls in the yarn support stand for changing the yarn rolls.

3,968,760

METHOD AND APPARATUS FOR THE PRODUCTION AND HANDLING OF ARTICLES, PARTICULARLY OF TUBULAR FORM

Herman Rovin, Norwalk; Rudolf Kreidel, Shelton, both of Conn., and Lawrence J. Levine, Valley Stream, N.Y., assignors to Automatech Industries Inc., Bridgeport, Conn.

Division of Ser. No. 365,098, May 30, 1973, Pat. No. 3,865,058. This application Nov. 27, 1974, Ser. No. 527,695
Int. Cl.² D05B *69/36*
U.S. Cl. 112—219 R **4 Claims**



1. The method of detecting a no-sew condition in a hemmed article during a sewing operation, which comprises
a. placing an unsupported region of the hemmed margin of the article under tension in the direction of the sewing, whereby a tension plane of the article is formed,
b. deflecting the article in the area of said unsupported region immediately adjacent but beyond the free edge of the hem in a direction away from said free edge and out of said tension plane thereby tending to effect a separation of the deflected portion of the article from said free edge, and
c. sensing the position of said free edge relative to said deflected portion, whereby a separation of said edge from said deflected portion in a direction toward said tension plane reflects a non-sewn condition of the hem.

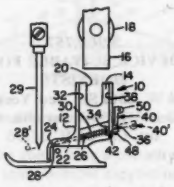
2. Means for detecting a sewn or unsewn condition between two layers of material, which comprises
a. means for supporting said layers of material under tension in the sewing direction, whereby a tension plane of said layers is formed, and with one layer projecting out from under the other in a direction at right angles to the sewing direction,
b. a deflector member positioned to contact the projecting portion of said one layer and being adjacent to but out of contact with said other layer,
c. said deflector member being operative to divert said projecting layer out of said tension plane, thereby effecting a separation of said projecting layer from said other layer when a non-sewn condition exists and deflecting said other layer out of said tension plane along with said projecting layer when a sewn condition exists, and
d. means to sense the path of the other layer of material in the region of said deflector member.

3,968,761

HAND AND SEWING MACHINE NEEDLE THREADER

Paul Tarrants, 207 Orchard Lane, Henderson, Ky. 42420

Filed May 9, 1975, Ser. No. 576,186
Int. Cl.² D05B *53/00, 87/00*
U.S. Cl. 112—225 **7 Claims**



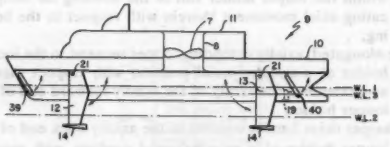
1. A sewing machine needle threader comprising
a presser foot defining a housing,
a movable rod slidably mounted in said housing,
a threading means connected to one end of said rod and adapted to insert through the eye of a needle,
biasing means confined in said housing about said rod tending to maintain said threading means in a retracted position in said housing, and
means for advancing said rod forward from said retracted position for movement of said threading means out of said housing to a position of engagement with an eye of a needle.

3,968,762

TRIPLE HYBRID WATERCRAFT

John R. Meyer, Jr., Kensington, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1975, Ser. No. 606,675
Int. Cl.² B63B *1/18*
U.S. Cl. 114—66.5 H **5 Claims**



1. A multi-modal watercraft having a wide speed range with favorable lift-to-drag ratio resulting in good performance under various sea conditions comprising:
a hull structure;
a superstructure mounted on said hull;
said hull structure includes a pair of buoyant sidewall structures attached to said hull structure;
a hydrofoil and strut system attached to said hull structure;
a forward seal and an after seal attached to said hull and sidewall structure for forming an air cushion with said sidewall structure;
a propulsion engine for providing a rotational shaft output mounted in said hull and sidewall structure;

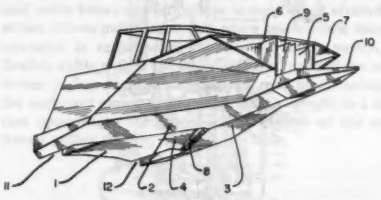
a dividing gearbox attached to said shaft output of said propulsion engine;
a set of clutches coupled to said dividing gearbox;
a subcavitating propeller selectively engagable to said gearbox with one of said clutches clutches;
a waterjet propulsion pump selectively engagable to said gearbox with the other of said clutches; and
at least one set of outlet jets and inlets for said propulsion pump.

3,968,763

RAMMED AIR CUSHION HYDROPLANE

John S. Mason, 105 Deepdene Road, Baltimore, Md. 21210

Filed Feb. 28, 1974, Ser. No. 446,670
Int. Cl.² B63B *1/34*
U.S. Cl. 114—67 A **4 Claims**



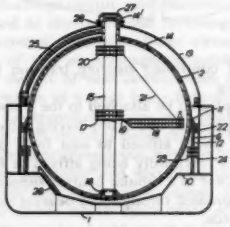
1. In a hydroplane boat, the combination of a buoyant hull provided with means of propelling and guiding the same, diagonal and transverse planing surfaces so disposed beneath said hull that they lift the hull above the surface of the water and at their lower extremities surround, confine, and fix the location of an air cavity beneath the center of gravity of the boat, and an air scoop in the bow of said hull which gathers air from the forward motion of the boat, forces it through a duct into said air cavity and pressurizes said air cavity, and which hull is equipped with a retractable bowsprit, said bowsprit being an extension of said diagonal planing surfaces which improves their ability to penetrate wave crests when extended, and which bowsprit seals and closes said air scoop when retracted to render said air scoop buoyant when the boat is not moving at high speed.

3,968,764

SHIPS FOR TRANSPORT OF LIQUEFIED GASES

Rolf Kvamsdal, Jeloy, and Roar Tobiassen, Stavanger, both of Norway, assignors to Moss Rosenberg Verft A/S, Jeloy, Norway

Filed Jan. 10, 1975, Ser. No. 540,095
Claims priority, application Norway, Oct. 31, 1974, 743932/74
Int. Cl.² B63B *25/08*
U.S. Cl. 114—74 A **3 Claims**



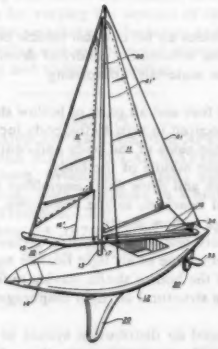
1. In a marine vessel for the transport of liquefied gas,
a hull,
a plurality of spherical tanks of non-cryogenic material for storage of said liquefied gas,
a cylindrical skirt extending from the hull of the vessel up to the equator of each tank and secured to the tank at the equator to support the tank,
a layer of thermally insulating material secured over the inner surface of the wall of each tank, the outer surface of the wall of each tank being accessible for inspection for faults;
scaffolding means provided at the interior and the exterior of each of said tanks to facilitate inspection of the interior insulating material and of the exterior of said tank wall, respectively;
each of said tanks further comprising:
a central column for enclosing piping extending into said tank through an opening in the top thereof and supporting said scaffolding means in the tank,
a truncated substantially conical member secured at its base to the bottom of the tank and extending upwardly therefrom to support said central column at its lower end in spaced relation to said bottom of the tank,
thermally insulating material disposed on the inner and outer surfaces of said substantially conical member and in said member between the lower end of the column and the tank,
and thermally insulating material on the upper portion of the column extending through the opening in the tank.

3,968,765

ROTATABLE-MOUNTING APPARATUS FOR SAILS

Robert L. Menegus, 62 Major St., Clifton, N.J. 07013

Continuation of Ser. No. 302,212, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 113,208, Feb. 8, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,882
Int. Cl.² B63H *9/04*
U.S. Cl. 114—102 **3 Claims**



1. An apparatus for mounting sails on a racing yacht, which comprises:
a. a step, adapted to be mounted on the hull of the racing yacht;
b. an elongated unitary boom;
c. rigging, connecting the sails to the boom; and
d. means for connecting the boom, intermediate its ends, parallel to and spaced from the hull, with no means other than the step connecting the boom to the hull, whereby the boom, sails and rigging are substantially freely rotatable as a unit about the step and relative to and unconnected to the hull, and so that the boom, sails and rigging

will automatically respond to maintain a substantially constant angle with respect to the direction of the shifting apparent wind, to provide maximum thrust, with minimum drag, for substantially increased yacht speed capabilities;

e. a rudder movably connected to the hull;

f. and a helm connected to the rudder for movement thereof angularly relative to the longitudinal axis of the boom.

3,968,766

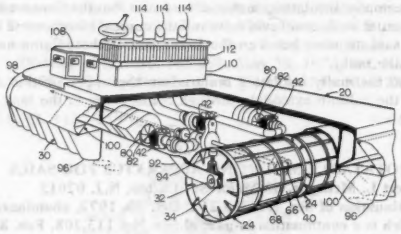
AMPHIBIOUS AIR CUSHION VEHICLE

William C. House, 4515 N. Lexington, Tacoma, Wash. 98407

Filed June 16, 1975, Ser. No. 587,099

Int. Cl.² B06V *1/00*

U.S. Cl. 115—1 R **8 Claims**



1. An amphibious air lift cushion vehicle equipped with low pressure variable inflatable cylindrical drum rollers made of air tight flexible materials, comprising:

a. a body;

b. transverse fore and aft pairs of hollow shafts mounted on bearings secured in turn to the body including end bearings near the sides of the body and central bearings supported at the middle of the body;

c. differentials and drive shaft assemblies secured adjacent the central bearings, to the respective hollow shafts of each pair of hollow shafts;

d. low pressure selectively variably pressurized cylindrical drum rollers made of air tight flexible materials mounted on each of the hollow shafts; having radial and longitudinal flexible structural air tight diaphragms in their interiors;

e. a compressed air distribution system to distribute selectively variably pressurized air throughout the hollow shafts and the interiors of the low pressure drum rollers from a compressed air generating source mounted on the body;

f. an air cushion lift system mounted on the body having lift fan assemblies, a plenum, and finger skirt assemblies around the base of the plenum; and

g. a power plant system mounted on the body for converting the energy of a fuel into mechanical driving power for turning the drive shafts and differentials thereby transmitting power to the hollow shafts and the low pressure cylindrical drum rollers, into mechanical driving power to drive the lift fan assemblies, and into mechanical driving power to operate the compressed air generating source serving the cylindrical drum rollers.

3,968,767

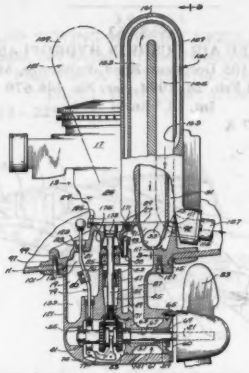
MARINE PROPULSION DEVICE ADAPTED FOR A SAILBOAT

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed June 24, 1974, Ser. No. 482,468

Int. Cl.² F01N *3/04*

U.S. Cl. 115—.5 E **14 Claims**



2. A marine propulsion device comprising a power head including a bottom face having therein an exhaust gas passage port, a lower unit connected to said bottom face and including a side surface, a propeller shaft, a propeller carried on said propeller shaft, and an exhaust gas passage communicating with said power head port and terminating in a port in said side surface, and an exhaust gas passage conduit connected to said lower unit for pivotal movement relative thereto and in communication with said port in said side surface and extending upwardly therefrom to above said power head and downwardly therefrom and being adapted to be connected to a duct discharging the exhaust gas into the atmosphere.

3,968,768

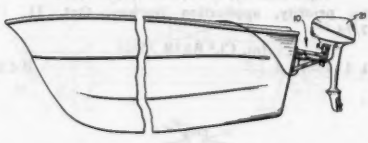
REMOTELY CONTROLLED STEERING TRANSOM FOR OUTBOARD MOTORS

Dean L. Solt, 3271 S. 1800 West, Granger, Utah 84119

Filed Sept. 29, 1975, Ser. No. 617,278

Int. Cl.² B63H *21/26*

U.S. Cl. 115—18 R **8 Claims**



1. A remotely controlled steering transom for outboard motors comprising

a. a frame adapted to be attached to the transom of a boat by mounting means, said frame having a front plate, top and bottom plates affixed to said front plate each of which extend rearwardly being affixed at the rear most portions thereof to a tubular bearing support,

b. a spindle journaled through said bearing support having projecting ends,

c. caps inserted over the projecting ends of said spindle, said caps being affixed to the vertical center portion of a rear metal plate,

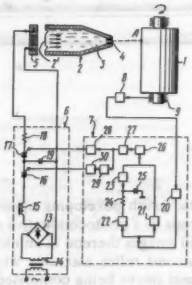
d. means affixed to said rear metal plate on which to mount an outboard motor,
e. bracket means affixed to the front plate of said frame between the top and bottom plates,
f. a reversible electric motor connectible to a battery attached to said bracket means and interconnected with a motor driven pulley,
g. a double acting switch attached to said reversible electric motor by means of an electric cable of sufficient length to be positioned at any desired location in the boat to be steered,
h. tension springs affixed to the front plate on either side of the reversible electric motor,
i. pulley means mounted on either side of the rear metal plate facing said tension springs, and
j. a flexible cable affixed at each end to the tension springs, said cable passing around said oppositely facing pulleys from an outside to the inside relationship, the portion of said cable between said pulleys being looped around said motor driven pulley such that when said electric motor is operated in response to the double acting switch, the flexible cable will be frictionally moved around the motor driven pulley thereby causing the rear plate containing the outboard motor to rotate about the spindle in a direction opposite to the direction of rotation of the motor driven pulley thereby steering the boat.

3,968,769

APPARATUS FOR BALANCING ROTORS

Anatoly Alexandrovich Gusarov, Unversitetsky prospekt, 5, kv. 470, and Lev Nikolaevich Shatalov, ulitsa Utrennyaya, 3, kv. 107, both of Moscow, U.S.S.R.

Filed Jan. 13, 1975, Ser. No. 540,665
Int. Cl.² B05B *15/00*
U.S. Cl. 118—8 **7 Claims**



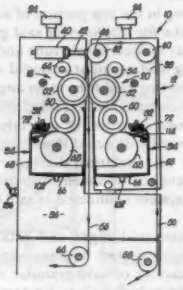
1. An apparatus for balancing rotors, comprising: a chamber for a balancing material, said chamber having a nozzle; an electromagnetic inductor, said chamber being arranged in the magnetic field thereof; a pulse generator having a charge circuit and a discharge circuit, said electromagnetic inductor being connected to the latter and receiving electric pulses therefrom; a control unit, said charge circuit and said discharge circuit of said electromagnetic inductor being connected to the output of said control unit; a transducer of vibration parameters of a rotor being balanced in the course of its rotation, said transducer being connected to the input of said control unit; said chamber being constructed so that upon the arrival at said electromagnetic inductor of electric pulses from said pulse generator and according to an instruction from said control unit, there are produced in said chamber magnetic pulse forces which eject doses of the balancing material from the nozzle of said chamber onto the light point area of the surface of the rotor being balanced in the course of its rotation.

3,968,770

TINTING FLUID DISTRIBUTING APPARATUS FOR WEB FED PRINTING PRESS

Robert G. Marrs, Emporia, Kans., assignor to Didde-Glaser, Inc., Emporia, Kans.

Filed July 3, 1974, Ser. No. 485,443
Int. Cl.² B05C *1/08*
U.S. Cl. 118—227 **8 Claims**



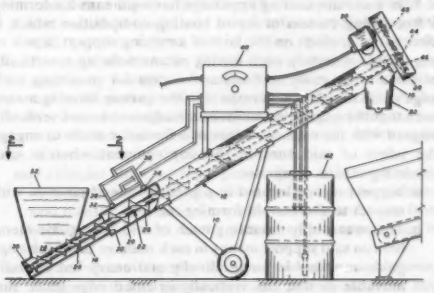
1. A web tinting unit, comprising:
at least one roll train having a number of elongated, rotatable rolls in tangential engagement along the lengths thereof and including an applicator roll at one end thereof and a tinting-fluid receiving roll at the opposite end thereof;
a plurality of spaced dispensing means disposed along the length of said tinting fluid receiving roll and proximal thereto for directing tinting fluid onto the periphery of the latter;
each of said dispensing means including a head having a tubular dispensing pipe in offset relationship to the geometric center thereof;
means mounting said heads for rotation thereof about respective axes for varying the amount of tinting fluid directed onto the periphery of the latter; and
structure supporting said roll train and dispensing means in web-receiving and tinting disposition.

3,968,771

PROCESS AND APPARATUS FOR APPLYING PESTICIDES TO GRANULAR MATERIALS

David D. Walgenbach, Brookings, S. Dak., and Kenneth E. Stocker, Indianola, Iowa, assignors to Chevron Research Company, San Francisco, Calif.

Filed May 23, 1974, Ser. No. 472,784
Int. Cl.² B05C *5/02*
U.S. Cl. 118—303 **7 Claims**



1. An apparatus for applying a liquid composition to a granular material which comprises:

a hollow cylindrical tube, said tube having a portion of reduced internal diameter at the low length thereof and being formed with an enlarged internal diameter adjoining said portion of reduced internal diameter at the lower length thereof and being formed with an enlarged internal diameter adjoining said portion of reduced internal diameter for the remaining length thereof;

a first opening in the bottom portion of said reduced-diameter portion of said tube for loading a granular material into said tube;

a second opening in the top portion of said enlarged-diameter of said tube for discharging said granular material;

a rotatable auger housed in said tube and operably mounted for conveying said granular material through said tube;

means for supporting said tube at an angle to the horizontal to essentially completely fill said granular material in said reduced-diameter portion of said tube;

at least one inwardly directed liquid spray nozzle assembly mounted on said enlarged-diameter portion and positioned adjacent said reduced-diameter portion;

a liquid supply system connected to said spray nozzle assembly; and

means for rotating said auger, said rotating auger and said tube being constructed and arranged to automatically meter the quantity of said granular material being conveyed from the reduced-diameter portion to the enlarged-diameter portion and to limit said quantity to an amount which will be packed loosely in said enlarged-diameter portion to permit said granular material to tumble and expose all surfaces to said composition.

3,968,772

CURTAIN COATING APPARATUS

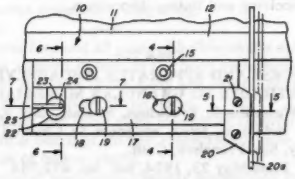
Jack F. Greiller, Ruislip, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 148,886, June 1, 1971, abandoned, which is a division of Ser. No. 883,185, Dec. 8, 1969, Pat. No. 3,632,403. This application Sept. 28, 1973, Ser. No. 401,786

Claims priority, application United Kingdom, Mar. 26, 1969, 15870

Int. Cl.² B05C *5.00*

U.S. Cl. 118—325 **5 Claims**



1. In a curtain-coating apparatus having means for forming a free-falling curtain of liquid coating composition which is directed to impinge on the face of a moving support, a pair of edge guide members each having means defining a vertically oriented edge guide surface, and means for mounting each edge guide member with respect to the curtain forming means such that the edge guide surfaces are adjacent to and vertically aligned with the opposite edges of a formed curtain to engage the edges of said curtain, the improvement wherein said mounting means comprises:

a. support means located in a predetermined position with respect to the curtain forming means;

b. means movably mounting each of said edge guide members on said support means in such manner that each edge guide member is longitudinally stationary but laterally movable so that the vertically oriented edge guide surfaces can be moved laterally in the plane of the curtain; and

c. control means for driving each said edge guide member a perdetermined distance laterally between first and second predetermined positions while maintaining the vertical orientation of the respective edge guide surfaces to adjust the width of a stable, free-falling curtain between said edge guide surfaces whereby the thickness of any edge bead formed in the curtain adjacent each edge guide surface is substantially reduced so that the coating assumes a substantially uniform thickness.

3,968,773

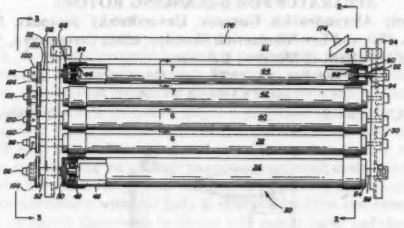
MAGNETIC BRUSH DEVELOPING APPARATUS

Terrence D. Charland, Pittsford, and Stanley D. Klett, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 442,036, Feb. 13, 1974, Pat. No. 3,906,898, which is a continuation-in-part of Ser. No. 255,721, May 22, 1972, abandoned. This application Mar. 3, 1975, Ser. No. 554,954

Int. Cl.² G03G *15/09*

U.S. Cl. 118—637 **3 Claims**



1. In a magnetic brush developing apparatus for applying developing materials to a photoconductive surface to develop electrostatic latent images thereon in an electrostatic printing machine, an improved roller assembly which comprises: an external sleeve, said sleeve being comprised of an electrically conductive material, and insulating members disposed on the end portions of said sleeve to electrically insulate said sleeve from external discharge.

3,968,774

MASTITIS DETECTOR

Kenneth Herbert Massie, Bromborough, England, assignor to Chalton Electronic Services Limited, Wales

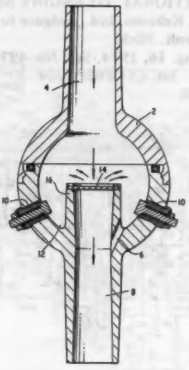
Division of Ser. No. 399,613, Sept. 21, 1973, Pat. No. 3,884,187. This application Mar. 5, 1975, Ser. No. 555,706

Int. Cl.² A01J *7/00*

U.S. Cl. 119—14.14 **4 Claims**

1. A cell comprising a casing defined by a generally spherical wall having diametrically opposed inlet and outlet ports, a tubular member within said spherical wall and forming an extension to one of said ports, the outer wall of the tubular member and a portion of the inner wall of the spherical wall defining an annular well, to receive a sample of milk flowing into the cell through said inlet port, and two electrodes extending through said spherical wall and having ends spaced

apart within said well, said tubular member having a drainage duct therethrough connecting said well to said one of said



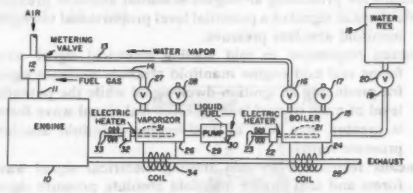
ports, said duct having dimensions such as to retain said milk sample in said well with said electrodes submerged therein.

3,968,775

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Webster B. Harpman, Poland, Ohio, assignor to Energy Research Inc., Greensburg, Pa.

Filed Sept. 24, 1973, Ser. No. 400,413
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 B 3 Claims



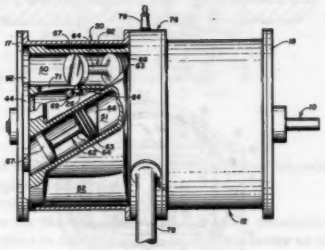
1. An improved fuel system for an internal combustion engine having an inlet manifold and comprising a metering valve in communication with said inlet manifold for controlling air and gaseous fuel entering the same and introducing said air and gaseous fuel into said inlet manifold, a water vaporizer and a supply of water therefor and a liquid fuel vaporizer and a supply of liquid fuel therefor, an unbroken flat heating surface in said liquid fuel vaporizer for flash generation of said gaseous fuel, an electric resistance heating unit in said flat heating surface operating at a temperature of at least 700°F. and means for introducing said liquid fuel into said fuel vaporizer and directing the same against said flat heating surface for said flash vaporization thereon, means establishing communication between said liquid fuel vaporizer and said metering valve and between said water vaporizer and said metering valve, valve means in said means establishing communication between said liquid fuel vaporizer and said metering valve arranged to permit said gaseous fuel to flow only from said liquid fuel vaporizer to said metering valve and means for controlling the amount of liquid fuel introduced into said fuel vaporizer responsive in operation to the pressure of gaseous fuel generated in said liquid fuel vaporizer.

3,968,776

ROTARY CRANKLESS MACHINE

Larry D. Rund, Marshall, Minn., assignor to Rund Rotary Engines, Inc., Marshall, Minn.

Filed Aug. 23, 1974, Ser. No. 500,013
Int. Cl.[2] F02B *53/08*
U.S. Cl. 123—43 C 9 Claims



1. A rotary crankless machine having a rotary shaft, a rotary cylinder block, and a stationary housing, all concentrically disposed with respect to a common axis,

said stationary housing having a central annular manifold block with inlet and outlet passages disposed approximately midway between the ends of said housing and extending inwardly from the outer annular wall of said housing, said annular manifold block having opposite surfaces facing the outer ends of said housing and having two opposed pairs of spaced openings, each of said pairs of openings extending through a different one of said opposite surfaces at a radial distance closer to the outer annular surface of said manifold block than to said common axis, said pairs of openings being connected together in sets, one set of openings communicating with said inlet passage and the other set of openings communicating with said outlet passage, said housing further having means for rotatably coupling together said rotary cylinder block and said shaft so that rotation of either one causes rotation of the other, and

said rotary cylinder block comprising two sets of oppositely directed cylinders each of which extends from adjacent an outer wall of said cylinder block inwardly towards said manifold block and through an inner surface of said cylinder block at the same radial distance from said common axis as the openings through the opposite surfaces of said manifold block, said inner surfaces conforming with said opposite surfaces and in sliding, sealing engagement therewith so that the inner ends of said cylinders are selectively brought into communication with said inlet and outlet passages of said manifold block as said cylinder block rotates, each of said cylinders having a longitudinal axis which is substantially inclined inwardly with respect to the common axis of said machine,

said cylinder block having a piston disposed in each of said cylinders each of which pistons has a piston head facing said manifold block and movable towards and away from said manifold block as the piston reciprocates within its cylinder,

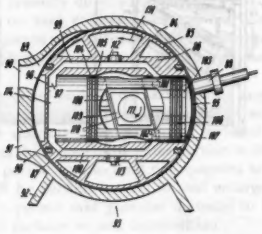
and cam means disposed between said stationary housing and each of said pistons to cause reciprocation of said pistons to result in or accompany rotation of said rotary cylinder block and hence rotation of said rotary shaft.

3,968,777

INTERNAL COMBUSTION ENGINE

Walter Franke, Maschen, u. Winsen-Luhe, Germany, assignor to Motoren Forschungs GmbH & Co. KG Franken Motoren, Hamburg, Germany

Division of Ser. No. 306,039, Nov. 13, 1972, Pat. No. 3,906,908. This application Apr. 17, 1975, Ser. No. 568,829
Claims priority, application Germany, Nov. 15, 1971, 2156586
Int. Cl.[2] F02B 57/00
U.S. Cl. 123—44 R 9 Claims



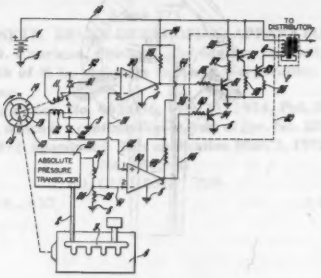
1. An internal combustion engine which comprises
a stator defining a circular cylindrical opening and having substantially diametrically oppositely disposed, first and second portions adjoining said opening, said stator being provided in said first portion with combustion-initiating means communicating with said opening and in said second portion with an intake port and an exhaust port communicating with said opening,
at least one cylinder diametrically extending in and rotatably mounted in said opening and adapted to control said combustion-initiating means and said intake and exhaust ports and having an open end and a bottom closing said cylinder at its opposite end,
a piston which is reciprocable in said cylinder and defines a power chamber with said open end and an air compression chamber with said bottom, said piston being adapted to move between a first dead center near said bottom and a second dead center opposite to said bottom,
said combustion-initiating means being adapted to initiate the combustion of a fuel-air mixture in said power chamber,
a transfer duct formed in said cylinder and adapted to connect said compression chamber to said power chamber when said piston is at said first dead center,
an inlet valve connected to said transfer duct,
a crankshaft operatively connected to said piston,
a rotatable drive shaft connected to said cylinder and adapted to rotate the same, and
torque-transmitting means arranged to rotate said drive shaft from a given position to a subsequent position which is angularly spaced 90° therefrom in response to a rotation of said crankshaft from a given position to a position which is spaced 90° therefrom in a sense which is opposite to the sense in which said subsequent position of said drive shaft is spaced 90° apart from said given position thereof.

3,968,778

ELECTRONIC INTERNAL COMBUSTION ENGINE IGNITION SPARK VACUUM AND SPEED ADVANCE SYSTEM WITH IGNITION DWELL TIME DIRECTLY PROPORTIONAL TO ENGINE SPEED

Charles C. Gambill, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1974, Ser. No. 497,868
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R 3 Claims



1. An electronic internal combustion engine ignition spark vacuum and speed advance system comprising in combination with an internal combustion engine and an ignition coil having a primary winding:
means for producing in timed relationship with said engine a first and a second series of phase displaced leading and trailing electrical signal wave forms of a potential level proportional to engine speed, the potential level of said second series of trailing electrical wave forms being greater than the potential level of said first series of leading electrical signal wave forms over the engine speed range;
means for producing an engine manifold absolute pressure electrical signal of a potential level proportional to engine manifold absolute pressure;
means responsive to said leading electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition dwell signal while the potential level of each of said leading electrical signal wave forms is greater than that of said engine manifold absolute pressure signal;
means responsive to said trailing electrical signal wave forms and said engine manifold absolute pressure signal for producing an ignition signal when the potential level of each of said trailing electrical signal wave forms has increased to that of said engine manifold absolute pressure signal; and
circuit means responsive to said dwell time and ignition signals for completing and interrupting, respectively, an energizing circuit for said primary winding of said ignition coil.

3,968,779

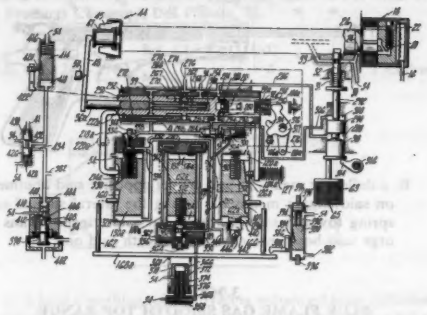
FUEL INJECTION PUMP AND INJECTION CONTROL SYSTEM THEREFOR

Charles W. Davis, Simsbury, Conn., assignor to Stanadyne, Inc., Hartford, Conn.

Filed Feb. 11, 1975, Ser. No. 548,906
Int. Cl.[3] F02D 1/00, 1/04
U.S. Cl. 123—140 FG 37 Claims

1. A fuel injection pump for delivering measured charges of fuel under high pressure to an associated engine comprising, a source of fuel under pressure, a charge pump connected to receive fuel from said source and pressurize the fuel to high pressure, and a control system for regulating the charges of fuel and their delivery to the engine; said control system in-

cluding injection timing means for controlling the timing of delivery of fuel by the charge pump, first and second pistons, actuating means for actuating the first piston to a position indicative of engine speed and for actuating second piston independently of the first piston to a position indicative of the



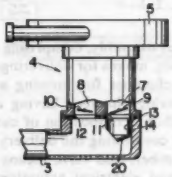
quantity of fuel in each charge of fuel delivered by the charge pump, and means interconnecting said pistons with each other and with said injection timing means for controlling the timing of injection according to the positions of the first and second pistons.

3,968,780

FUEL SYSTEM FOR MULTICYLINDER ENGINES

Toshiaki Konomi, and Jyoji Nurita, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed July 18, 1974, Ser. No. 489,549
Claims priority, application Japan, Jan. 17, 1974, 49-7529
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **5 Claims**



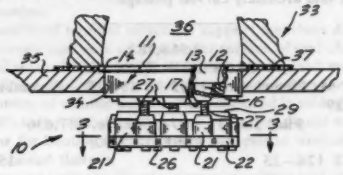
1. In a multicylinder engine comprising an intake manifold having branches in communication with the cylinders and an intake port, and a carburetor having an axially extending primary barrel and an axially extending secondary barrel each in communication with said intake port, the improvement comprising that said secondary barrel is adjacent to and located downstream from said primary barrel toward said intake port, a hollow cylinder coaxial with said primary barrel and attached thereto at the downstream end of said primary barrel, a deflector attached to said hollow cylinder near its downstream opening and extending across a portion of the downstream opening, said deflector positioned for reorienting axial flow through said at least one barrel toward said intake port, said deflector defining with said hollow cylinder two openings from the downstream end of said first hollow cylinder, whereby the fuel-air mixture may be equally distributed among the cylinders.

3,968,781

FUEL ATOMIZING DEVICE FOR CARBURETORS OF INTERNAL COMBUSTION ENGINES

Carl George Stephenson, 2052 Paulus Crescent, Burnaby, British Columbia, Canada

Filed Sept. 30, 1974, Ser. No. 510,426
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **5 Claims**



1. A fuel atomizing device for carburetors of internal combustion engines comprising:

a. a plurality of tapered nozzles,

b. means for securing said nozzles in axial parallelism with each other in the air passage of the carburetor so that the air/fuel mixture passing through said passage passes through said nozzles and issues a plurality of jets from said nozzles,

c. a plurality of cylindrical cups having knife-edged open ends and being equal in number to said nozzles, each cup being located so that each said cup is spaced downstream of the discharge end of an associate nozzle and has its open end opening toward said associated nozzle,

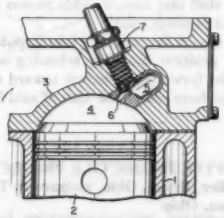
d. each of said cups being axially aligned with its associated nozzle and being spaced downstream from its associated nozzle for receiving the jet of air/fuel mixture issuing from its associated nozzle.

3,968,782

TORCH IGNITION TYPE INTERNAL COMBUSTION ENGINE WITH A RESTRICTED ORIFICE

Masaaki Noguchi, Nagoya, and Takashi Kato, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1974, Ser. No. 534,584
Claims priority, application Japan, July 31, 1974, 49-87799
Int. Cl.² F02B *19/12, 19/18*
U.S. Cl. 123—191 S **4 Claims**



1. A torch ignition internal combustion engine of the type which has no intake valve in the auxiliary combustion chamber, said engine comprising:

a cylinder;

a reciprocating piston snugly received in said cylinder;

a main combustion chamber defined between the head of said cylinder and said piston and having an intake valve and an exhaust valve to control intake and exhaust ports in the cylinder head;

an auxiliary combustion chamber, having a volume smaller than that of the main combustion chamber, provided on the cylinder head;

an arcuately curved passage interconnecting said main and auxiliary combustion chambers, and the cross-sectional area of the passage is made sufficiently small to ensure sufficient velocity of flow therethrough; and

an ignition plug mounted on the cylinder head with its sparking electrodes located in a circumferential portion of said arcuately curved passage.

3,968,783

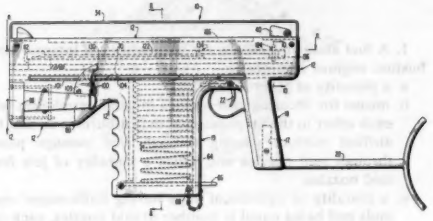
CROSSBOW TYPE GUN

James M. Pfotenhauer, 1302 N. 19th St., Escanaba, Mich. 49829

Filed July 11, 1974, Ser. No. 487,636

Int. Cl.² F41B 7/00

U.S. Cl. 124—25 **15 Claims**



1. A bow gun comprising:

a body having a channel disposed therein, said channel including a projectile discharge bore and a cocking bore, said discharge bore having a projectile discharge opening at a forward end thereof;

a magazine chamber communicating with said channel for storing a plurality of projectiles for sequential discharge;

a bow mounted on said body at a forward end thereof, said bow carrying a bow string; impulse slide means disposed for reciprocal movement within said discharge bore and including a cocking head disposed in said cocking bore;

said bow string being connected to said impulse slide means; cocking slide means disposed for reciprocal movement in said cocking bore relative to and ahead of said cocking head for shifting said impulse slide means rearwardly in said cocking bore;

a manually actuable cocking lever means pivotally mounted to said gun body and connected to said cocking slide to effect rearward movement thereof toward said cocking head to shift said impulse slide means rearwardly toward a cocked position; and

triggering means for retaining said impulse slide means in a cocked position and for releasing said impulse slide means for forward movement toward a projectile in said discharge bore under the bias of said bow string.

3,968,784

SPRING TYPE PROJECTILE PROJECTING DEVICE

Larry E. Miller, Bryan, Ohio, assignor to The Ohio Art Company, Bryan, Ohio

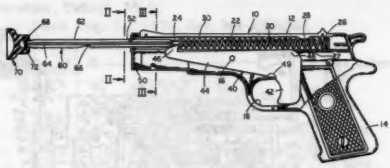
Filed Feb. 10, 1975, Ser. No. 548,263

Int. Cl.² F41B 7/00

U.S. Cl. 124—27 **8 Claims**

1. In a dart gun comprising a barrel having an outer open end and a closed inner end, a helical compression spring in said barrel engaging said closed inner end, and a projectile having a shank with a notch therealong and being insertable in said open outer end of said barrel for compressing said spring, the improvement comprising:

A. a trigger means for holding and releasing said projectile having a longitudinal portion extending along said barrel intermediate the ends thereof, and being pivoted intermediate said longitudinal portion adjacent said barrel, said longitudinal portion having a hook at one end engageable with said notch in said projectile and an abutment at its other and engageable with the side of said spring, and



B. a deflector means in said barrel opposite said abutment on said trigger means for urging the lateral side of said spring towards said abutment on said trigger means to urge said hook into engagement with said notch.

3,968,785

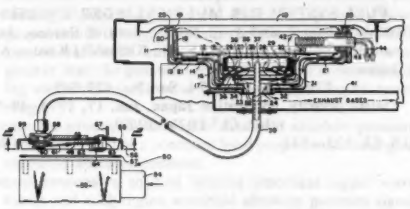
BLUE FLAME GAS SMOOTH TOP RANGE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Division of Ser. No. 432,547, Jan. 11, 1974, Pat. No. 3,870,457, which is a continuation of Ser. No. 223,451, Feb. 4, 1972, abandoned. This application Dec. 26, 1974, Ser. No. 536,352

Int. Cl.² F24C 3/04

U.S. Cl. 126—39 J **8 Claims**



1. A gas burner assembly, comprising housing means having a mixing chamber, means for delivering a gaseous fuel and air to said mixing chamber for forming a combustible mixture therein, said mixing chamber having outlet port means for issue and blue flame combustion of such mixture, automatic valve means for controlling the delivery of the gaseous fuel to said mixing chamber, said valve means including a valve closure member, and electrical actuating means for operating said valve closure member to open and to close the same, and a glow type electric resistance igniter positioned to ignite the mixture issuing from said outlet port means, said igniter being operative to develop appreciable thermal energy and connected in circuit with said electrical actuating means for concurrent energization with the latter, said electrical actuating means including a thermally responsive member operatively connected to said valve closure member for opening and closing the same, and electric heater means for applying thermal heat to actuate said thermally responsive member, and means for pre-adjusting said actuating means to determine the response thereof with said valve closure member in condition capable of operation including means for applying a pre-load on said valve closure member and means for adjusting such pre-load to vary the responsiveness of said thermally responsive member for opening and closing said valve closure member, so that the response times of said automatic valve means and igniter are related in normal operation of said gas burner assembly such that said valve closure member remains closed until said igniter attains a temperature approximately at which

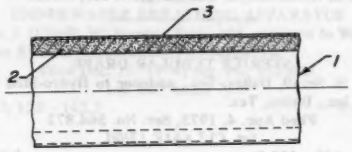
ignition of the combustible mixture at the outlet port means occurs.

3,968,786

SOLAR HEAT ABSORBING TUBING

David H. Spielberg, Schaumburg, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 15, 1974, Ser. No. 470,254
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 7 Claims



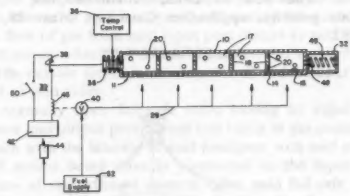
1. A heat absorbing tube providing enhanced solar radiation collection efficiency, which comprises in combination, a tubular member formed of plastic material containing a sufficient quantity of small electrical conductive black body absorber particles distributed throughout the thickness thereof to render said tubular member electrically conductive, and said black body particles being composed of conductive carbonaceous pyropolymer formed on a refractory oxide base material from a pyrolyzable organic material contacting said base material at a high temperature in the range of 400° to 750° C.

3,968,787

CONTROLLED VAPOR CHAMBER COOKING DEVICE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 16, 1973, Ser. No. 342,022
Int. Cl.[2] A47J 37/00
U.S. Cl. 126—390 4 Claims



1. A controlled vapor chamber cooking device having:
a housing defining a sealed vapor chamber and having an extended top wall for providing a cooking surface;
a capillary wick disposed along the bottom surface of said chamber;
a plurality of internal structural support members disposed between said wick and the upper surface of said chamber and secured to said upper surface, said support members defining a plurality of vapor pressure equalization holes;
a quantity of volatile working fluid disposed in said chamber sufficient to saturate said wick when in a liquid state;
means for heating said chamber to vaporize working fluid contained therin;
means responsive to the vapor pressure within said chamber for controlling said heating means to maintain said vapor pressure within a predetermined range; and
means defining an auxiliary chamber having a volume equal to at least about twice the liquid volume of said working fluid in fluid communication with said vapor chamber, a valve disposed to selectively allow and preclude said fluid communication and pressure actuated means for controlling said valve to preclude said fluid communication under normal operating conditions and to allow said fluid communication upon the occurrence of said overpressure condition.

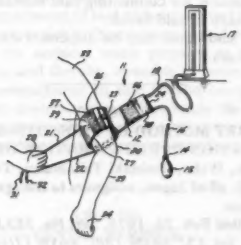
3. A controlled vapor chamber cooking device having:
a housing defining a sealed vapor chamber and having an extended top wall for providing a cooking surface;
a capillary wick disposed along the bottom surface of said chamber;
a plurality of internal structural support members disposed between said wick and the upper surface of said chamber, and secured to said upper surface, said support members defining a plurality of vapor pressure equalization holes;
a quantity of volatile working fluid disposed in said chamber sufficient to saturate said wick when in a liquid state;
means for heating said chamber to vaporize working fluid contained therein;
means responsive to the vapor pressure within said chamber for controlling said heating means to maintain said vapor pressure within a predetermined range; and
means defining an auxiliary chamber adjacent to said vapor chamber and for providing a fluid passageway between said auxiliary chamber and said vapor chamber, and pressure sensitive rupturable means disposed in said passageway for normally precluding fluid communication between said vapor chamber and said auxiliary chamber and designed to rupture when the pressure differential between said chambers reaches said overpressure condition.

3,968,788

SPHYGOMANOMETER BAND AND METHOD OF SELF-APPLICATION THEREOF

John Paxton Hopkins, 4146 Blvd. Place, Mercer Island, Wash. 98040

Filed May 29, 1975, Ser. No. 581,715
Int. Cl.[2] A61B 1/00
U.S. Cl. 128—2.05 C 6 Claims



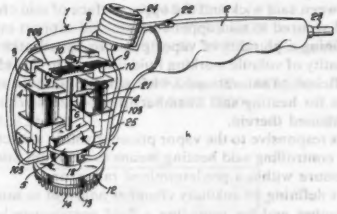
1. An improved sphygomanometer having an elongate, pliable, inflatable band capable of being self-applied by the patient to an upper portion of one of his arms wherein the improvement comprises:
a pair of elongate tensioning cords each having one end connected to a first end of said inflatable band adjacent opposite longitudinal edge portions thereof, whereby the patient may dispose the first end of said band on his arm and hold it in place by applying tension to said cords while a second end of said band is pulled taut and wrapped circumferentially about the arm overlapping said first band end.

3,968,789

APPARATUS FOR MASSAGING THE SKIN

Giancarlo Simoncini, 47, Via Jussi, San Lazzaro di Savena, Italy (40068)

Filed Oct. 29, 1974, Ser. No. 518,589
Claims priority, application Italy, Oct. 31, 1973, 12908/73
Int. Cl.[2] A61H 7/00, 15/00
U.S. Cl. 128—49 6 Claims



1. Apparatus for massaging the skin, comprising:
a. a casing provided with a handle;
b. an electric motor having a shaft, housed in said casing and being capable of imparting to said shaft a rotary oscillatory movement;
c. support means for carrying a skin massaging element, comprising a non circular support plate, integral with said shaft for rotation therewith, said plate being provided with a circular plug, coaxial with said motor shaft;
d. a skin massaging element, comprising a brush having a dispensing bore for fluid formed therein, provided with a non circular recess and with a cylindrical socket, said recess and said socket being adapted to complementarily removably receive respectively said support plate and said plug;
e. a container for a liquid or pasty substance, arranged on the casing in proximity to said handle and being provided with at least a flexible portion adapted to be manually pressed; and
f. conduit means for connecting said container to said dispensing bore in said brush,
whereby said liquid may be dispensed during rotation of said brush.

3,968,790

ELECTRET METHOD OF PROMOTING CALLUS FORMATION IN REGENERATION OF BONES

Eiichi Fukada, Wako; Toshiaki Takamatsu, Tokyo, and Iwao Yasuda, Uji, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Feb. 26, 1975, Ser. No. 553,097
Int. Cl.[2] A61N 1/00; A61B 17/18
U.S. Cl. 128—82.1 5 Claims

1. A method of promoting callus formation on bones comprising applying to a bone an electret composed of a material selected from the group consisting of polytetrafluoroethylene, polyhexafluoropryopylene, polyesters, polypropylene, carnauba wax, bees wax, and rosin, said electret being charged, prior to application to the bone, at a density of at least 30 e.s.u./cm^3.

3,968,791

ORTHOPEDIC BANDAGE COMPRISING DIACETONE ACRYLAMIDE, AND CAST PREPARED THEREFROM

John Wesley Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed Jan. 29, 1975, Ser. No. 545,078
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—90 9 Claims

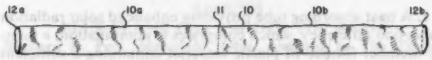
1. An orthopedic bandage comprising a flexible carrier having adhered thereto a cast-forming composition comprising diacetone acrylamide and a water-insoluble condensation product of formaldehyde and diacetone acrylamide.

3,968,792

STERILE TUBULAR DRAPE

Martin H. Small, Dallas, Tex., assignor to Hydro-Med Products, Inc., Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 564,872
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—132 D 9 Claims



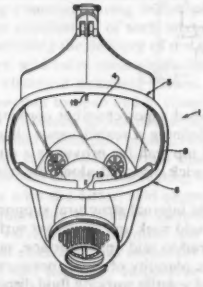
1. A sterile drape comprising a tubular stockinette open at both ends and closed at about the middle to form two tubular stockinettes each having an open end and a mutual closed end, one of said tubular stockinettes reversed and drawn over the other tubular stockinette to form a double-walled tubular stockinette having one open end and one closed end; the double-walled tubular stockinette having the open end thereof folded outwardly from the center thereof and rolled toward the closed end.

3,968,793

CLAMPING RING FOR THE WINDOW FRAME OF A BREATHING MASK

Rolf Geissler, Berlin, Germany, assignor to Auergesellschaft GmbH, Berlin, Germany

Filed Mar. 27, 1975, Ser. No. 562,409
Claims priority, application Germany, Mar. 28, 1974, 2415492
Int. Cl.[2] A62B 9/04
U.S. Cl. 128—141 R 9 Claims



1. A clamping ring for a breathing mask viewing window held in a groove in a flexible frame at the front of the mask, the ring comprising two channel-shape half rings engaging each other at their ends and having on the outside of each of their end portions a pair of laterally projecting vertical flanges so that said end portions are H-shape in cross section, each pair of said engaging ends being provided with a guide member extending between the flanges of one of the half rings and projecting vertically from the end portion of said one of the

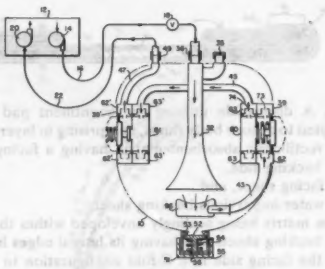
half rings into the space between the flanges of the other half ring, a cross member extending between said flanges of said other half ring and spaced from the end portion of said other half ring, said cross member and said guide member each having a bore therethrough in axial alignment, a bolt rotatably mounted in each bore through said cross member and the adjacent guide member, and a nut on the end of each bolt, whereby the ends of each half ring can be drawn into contact with the ends of the other half ring to hold the half rings together.

3,968,794

UNDERWATER BREATHING APPARATUS

Wilbur J. O'Neill, W. Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1974, Ser. No. 531,845
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.3 9 Claims



1. Underwater breathing apparatus comprising:

A. diver headgear including an input connection means for receiving breathing gas, from a remote source and an output connection means for returning exhaust gas back to said source:

B. an exhaust control valve having input port means and output port means and connected to said output connection means of said headgear, and means for controlling the flow of gas from said input port means to said output port means whereby the headgear pressure is maintained within certain limits relative to the ambient water pressure at said valve;

C. a normally open fail-safe valve having an input port means and output port means and being in gas communication with the interior of said headgear with said output port means being directly connected to the input port means of said exhaust control valve, said fail-safe valve further including means for controlling the flow of gas from said input port means to said output port means whereby the fail-safe valve will close upon failure of said exhaust control valve in an open position.

3,968,795

UNDERWATER BREATHING APPARATUS

Wilbur J. O'Neill, W. Severna Park, and John R. Colston, Annapolis, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1974, Ser. No. 531,849
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.3 13 Claims

1. Underwater breathing apparatus comprising:

A. diver headgear including an input connection means for receiving breathing gas from a remote source and an output connection means for returning exhaust gas back to said source;

B. an exhaust flow path connected to said output connection means and including a normally open fail-safe valve and an exhaust control valve in series arrangement, with each said valve including three compartments;

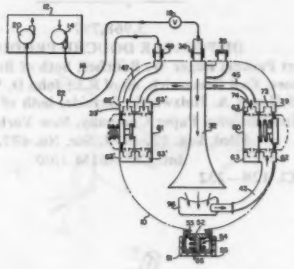
C. said exhaust flow path including a first duct communicating the interior space for said headgear with a first compartment of said fail-safe valve;

D. a second compartment of said fail safe valve being directly communicative with a first compartment of said exhaust control valve;

E. a second compartment of said exhaust control valve being directly communicative with said output connection means;

F. said first compartment of said respective valves being communicative with said second compartment of said respective valves;

G. the third compartment of each said valve being out of said flow path and being in direct pressure communication with said interior space for sensing the pressure therein;



H. said third compartment of said fail-safe valve including means responsive to the pressure in said interior space relative to the ambient water pressure at said fail safe-valve and operable to prevent flow from said first compartment to said second compartment of said fail-safe valve when the pressure in said interior space falls below predetermined limits relative to the ambient water pressure at said fail-safe valve;

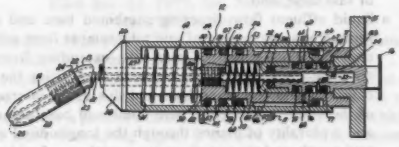
said third compartment of said exhaust control valve including means responsive to the pressure in said interior space relative to the ambient water pressure at said exhaust control valve and thereby, operable to control flow from said first compartment to said second compartment of said exhaust control valve and maintain the pressure in said interior space within said predetermined limits relative to the ambient water pressure at said exhaust control valve.

3,968,796

DENTAL SYRINGE

Ronald L. Baker, Florence, Ky., assignor to Thomas G. Lutes, Fort Mitchell, Ky., a part interest

Filed Sept. 23, 1974, Ser. No. 508,154
Int. Cl.[2] A61M 11/00
U.S. Cl. 128—173.1 10 Claims



1. A dental syringe comprising,

a handle,
a housing mounted on said handle,
a nozzle rotatably mounted in and projecting from one end of said housing and having an angulated tip,
an operator rotatably mounted at the other end of said housing,
means connecting said operator to said nozzle to rotate said nozzle about its axis upon rotation of said operator to change the direction of said tip with respect to said handle,
valve means in said housing,
means for supplying air and water to said housing, the flow of said air and water to said nozzle being controlled by said valve means,
said operator being axially slidable and connected to said valve means to control one of said fluids,
a push button coaxial with said operator, said push button being axially slidable to and connected to said valve means to control the flow of said other fluid.

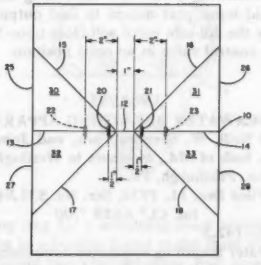
3,968,797
DISPOSABLE DOUCHE PRODUCT
Gilbert Packer; Roger W. Boucher, both of Bristol; James M. Moore, East Greenwich, all of R.I.; John D. Wark, Freeport, and Henry A. Holzwarth, Bayside, both of N.Y., assignors to International Paper Company, New York, N.Y.
Filed Aug. 13, 1974, Ser. No. 497,122
Int. Cl.² A61M *1/00*
U.S. Cl. 128—232 **46 Claims**

1. A douche nozzle adapted to be attached to a liquid container comprising:
a flexible, elongated tube having a passageway therethrough, at least one aperture through a first end of said tube communicating with said passageway and formed to direct liquid flowing outwardly of the container through said passageway substantially transversely of the long axis of said tube, and
a liquid effluent flow-directing combined base and shield formed at a second end of said tube remote from said first end, the axial extent of said tube extending from said combined base and shield being at least twice the axial extent of said combined base and shield, the intersection of the exterior surface of said combined base and shield and a plurality of planes through the longitudinal axis of said nozzle and spaced about the periphery of said nozzle each defines a continuous concave curve having a predetermined radius of curvature,
the base portion having a substantially concial configuration, a bottom wall and means adapted to sealingly affix said base portion on a liquid container,
a flexible shield portion having at least a section thereof extending away from said first end and beyond said bottom wall and adapted to overlap the container when mounted thereon, said combined base and shield directing the flow of effluent which has left the nozzle downwardly substantially perpendicularly to the longitudinal axis of said nozzle.

3,968,798
INCONTINENT PAD
Kenneth C. Hokanson, Greenwood, S.C., assignor to Parke, Davis & Company, Detroit, Mich.
Filed July 3, 1975, Ser. No. 592,962
Int. Cl.² A61F *13/16, 13/18*
U.S. Cl. 128—284 **7 Claims**

1. A disposable nursing or incontinent pad or the like adapted to absorb body fluids, comprising in layered relation:
a rectilinear absorbent matrix having a facing side and a backing side,
a facing sheet, and
a water-impervious backing sheet,
the matrix being sealingly enveloped within the facing and backing sheets and having its lateral edges infolded onto the facing side in a C-fold configuration to provide two spaced apart infolded flaps and a middle portion between the fold lines,
the facing sheet being wider than the matrix and extending over the facing side of the middle portion and the outer and inner faces of each of the infolded flaps,
the backing sheet being narrower than the matrix and overlapping the facing sheet on said outer face such that the pad in fluid absorbing relation with the body is resistant to lateral run-off of fluid.

3,968,799
PREFOLDED DISPOSABLE DIAPER
Mark S. Schrading, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 4, 1975, Ser. No. 565,046
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **3 Claims**



1. In a prefolded disposable diaper of substantially rectangular configuration having an exterior surface and an interior body contacting surface which is folded in half transversely with the body contacting surface internally disposed and in which outer segments of the transverse fold are inverted and

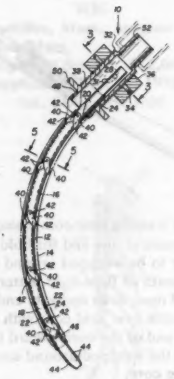
tucked back into the interior of the diaper to form a pair of facing triangular panels on each side of the folded diaper to define a central disposed flat-bottomed pocket, the improvement wherein the internally disposed surfaces of the facing panels on each side of the pocket are adhesively attached to the interior body contacting surface by means of a short narrow stripe of adhesive spaced outwardly from the pocket and disposed perpendicular to and straddling the inverted transverse fold, the flat bottom of said diaper having a dimension of about 1 inch to 4 inches and each of said adhesive stripes being spaced from the respective end portion of said pocket a distance of from about ½ inch to 2 inches.

3,968,800

DEVICE FOR INSERTION INTO A BODY OPENING

Joseph A. Vilasi, 37 Wagon Wheel Lane, Dix Hills, N.Y. 11746

Filed Sept. 17, 1974, Ser. No. 506,683
Int. Cl.² A61M *29/00*, *16/00*
U.S. Cl. 128—343 **20 Claims**



1. A device for insertion into a body opening comprising a tube-like member longer in length than in cross section having an uninterrupted relatively smooth outer surface yieldable to vary in cross section along substantially its full length,

a hollow passage extending through the full length of said member,

means movable in response to a selective operation to vary the cross section of the outer surface of said member along substantially the full length thereof,

and operable means connected with said movable means to selectively move the same to vary the cross section of said outer surface of said member.

3,968,801

CALF PULLER

Jerry Lee Simon, Zeona, S. Dak. 57795, and Larry Ray Schuelke, Mud Butte, S. Dak. 57758

Filed Nov. 14, 1974, Ser. No. 523,672
Int. Cl.² A61B *17/42*
U.S. Cl. 128—352 **73 Claims**

1. Force exerting mechanism comprising:

supporting means,

movable means supported by said supporting means,

said movable means including lever means for moving said movable means relative to said supporting means,

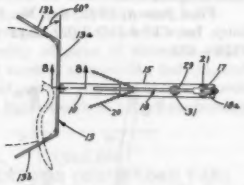
said lever means including a handle swingable between a first position in which the lever means are deactivated and a second position in which the lever means cause said movable means to move relative to said supporting means,

attachment means carried by said movable means, said attachment means being adapted for connection to an object on which said force is to be exerted,

movement of said movable means relative to said supporting means in one direction transmitting a force in the same direction through said attachment means to said object,

locking means for releasably holding said supporting means and movable means against movement relative to one another in at least one direction,

said locking means including a locking member swingable into and out of engagement with said supporting means, said locking member when engaged with the supporting means holding said supporting means and movable means against movement relative to each other in one direction while permitting relative movement between the supporting means and movable means in the opposite direction,



a pair of opposed spaced apart supporting elements mounted on said movable means for said locking member,

means pivotally supporting said locking member between said supporting elements for swinging movement therebetween,

spring means biasing said locking member towards locking engagement with said supporting means, said spring means having two end portions, one end portion being attached to said locking member, the other end portion being attached to said supporting element,

release means carried by said handle for releasing said locking means in response to the actuation of said lever means, said release means being adapted to engage said locking member when said locking member is in engagement with said supporting means and swing it out of engagement with said supporting means, and

said engagement of said release means and locking member taking place as said handle moves toward said first position.

3,968,802

CAUTERY PROTECTION CIRCUIT FOR A HEART PACEMAKER

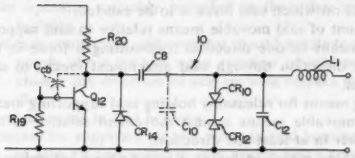
Joseph A. Ballis, Roseville, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 24, 1975, Ser. No. 543,978
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **10 Claims**

1. A heart pacemaker circuit comprising:

a. output switch means controllably turned on and off at a rate corresponding to that with which it is desired to stimulate a patient's heart and having outputs from which a heart stimulating signal is derived, said switch means being characterized by a first conduction therethrough greater than a second conduction in an opposite direction therethrough; and

b. means disposed across the output of said switch means for preventing the difference between the first and second



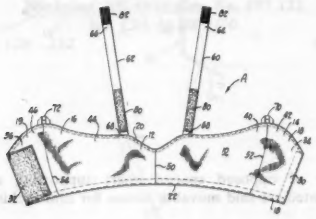
conductions of said switch from rendering induced signals in the circuit output unsymmetrical.

3,968,803

SURGICAL CHEST DRESSING

Davie S. Hyman, Gates Mills, Ohio, assignor to Golda, Inc., Cleveland Heights, Ohio

Filed June 4, 1975, Ser. No. 583,785
Int. Cl.[2] A41C *3/02*; A61F *13/00*
U.S. Cl. 128—482 **10 Claims**



1. A surgical chest dressing comprising: a chest encircling flexible band formed primarily from a stretchable material, said band having a longitudinally continuous back portion adapted to lie against the back of a person using said dressing; said continuous back portion having two longitudinally spaced ends, with each of said ends connected to one of a pair of front flaps; said front flaps including free ends spaced from said back portion and overlapping each other at engaging surfaces when said dressing is wrapped around a person using the same; a two element, contact sensitive, reusable fastening means for releasably securing said free ends together in selected, adjustable longitudinal positions with one element of said fastening means being secured to each of said engaging surfaces of said free ends; first and second straps, each of said straps being fixedly secured onto said back portion; and, means on each of said front flaps for securing one of said straps thereto.

3,968,804

EXTRUDED TOBACCO SHEET

T. Kenneth Kelly, Fairfield, and Donald Alfred Savitz, Stamford, both of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,614
Int. Cl.[2] A24B *3/14*
U.S. Cl. 131—140 C **6 Claims**

1. A process for the preparation of reconstituted tobacco materials which comprises

forming a composition consisting essentially of tobacco particles, a thermoplastic binder, and less than 15% moisture;

maintaining said composition in an enclosed atmosphere under a pressure of between about 1000 and about 3000 psig and an elevated temperature, sufficient to render the composition plastic, of between about 100°C. and about 150°C.;

injecting an inert gas into said composition, wherein the inert gas in injected at a temperature within 20°C. and 60°C. of the temperature of said composition;

working said composition to effect a uniform distribution of fine bubbles therein;

expressing said composition through an orifice to form said composition into the shape of such orifice; and

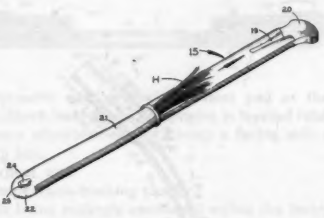
cooling.

3,968,805

HAIR TREATMENT APPARATUS

Thomas J. Sobeck, Jr., 813-815 NE. 125 St., North Miami, Fla. 33161

Filed Sept. 8, 1975, Ser. No. 611,402
Int. Cl.[2] A45D *19/16*
U.S. Cl. 132—9 **14 Claims**



1. Apparatus for treating hair comprising:

a core having means at one end for holding the free end of strands of hair to be wrapped around the core;

and a flexible sheath of fluid-tight material which is closed at one end and open at its opposite end, said sheath being slidably insertable over said core with said open end first from said one end of the core toward the opposite end of the core while the wrapped-around strands of hair remain in place on the core;

said core being slidably removable from said open end of the sheath while leaving the strands of hair inside the sheath;

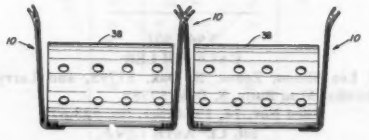
and said sheath having an opening for introducing hair-treating fluid, and a removable closure for said opening.

3,968,806

HAIR CLIP

Kenneth Altemare, 5247 Brownsville Road, Pittsburgh, Pa. 15236

Filed Feb. 12, 1975, Ser. No. 549,316
Int. Cl.[2] A45D *8/24*
U.S. Cl. 132—48 R **8 Claims**



1. A hair clip for holding a hollow, thinwalled, tubular hair curler in position when setting hair comprising:

a. an elongated base member with a pivot support mechanism formed adjacent one end, an operating tab positioned on said base member between said pivot support member and said one end, and a clamping jaw portion positioned remotely of said operating tab at the other end and extending at an obtuse angle to said base member;

b. an elongated movable member with a pivot support mechanism formed adjacent one end, an operating tab positioned on said movable member between said pivot support member and said one end, and a clamping jaw portion positioned remotely of said operating tab at the other end and extending at an obtuse angle to said movable member such that said tubular hair curler is received between said base member clamping jaw portion and said movable member clamping jaw portion;

c. pivot means retained by said pivot support mechanisms for pivotally connecting said base member to said movable member in substantially spaced parallel, overlying relation with said operating tabs extending diametrically beyond the surface of said tubular hair curler to facilitate clamping of said clip thereto; and

d. spring means positioned between said base member and said movable member around said pivot means for urging said members toward each to move said clamping jaw portions into abutting relation when said clip is closed and securely retain therebetween said tubular hair curler.

3,968,807

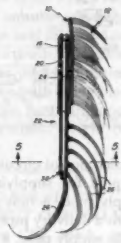
WIG

John Kraicer, Brookline, Mass., assignor to Europa Group, Inc., South Boston, Mass.

Continuation-in-part of Ser. No. 512,006, Oct. 4, 1974, abandoned. This application Feb. 11, 1975, Ser. No. 548,897

Int. Cl.² A41G *3/00*

U.S. Cl. 132—53 **18 Claims**



1. A wig comprising:

a base structure having an edge portion;

a multiplicity of hairs secured to said base portion;

a plurality of fingers secured to the lower edge of said base portion in spaced relation therealong, said fingers extending generally downwardly therefrom; and

a plurality of hairs attached to each of said fingers.

3,968,808

COLLAPSIBLE SELF-SUPPORTING STRUCTURE

Theodore R. Zeigler, 2007 R St., NW., Washington, D.C. 20009

Filed Nov. 6, 1974, Ser. No. 521,472

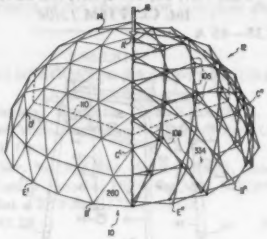
Int. Cl.² A45F *1/16*; E04H *12/18*

U.S. Cl. 135—4 R **28 Claims**

1. A self-supporting structure, comprising in combination:

a network of column-like elements freely pivotally joined together to form the self-supporting structure, there being groups of said elements which intersect and are freely pivotally joined at their ends to define inner and outer apical points, said outer apical points lying on a surface of revolution and said inner apical points being paired each with a corresponding outer apical point and being spaced inwardly from their corresponding outer apical points along radial lines normal to said surface of revolution;

there being at least three elements forming each of said groups which elements radiate from their corresponding apical points to join with other elements at other surrounding apical points, with those elements radiating from each inner apical point lying essentially in a common plane and radiating from such inner apical point to a plurality of surrounding outer apical points, whereby the network is characterized by a series of planes essen-



tially within which lie elements radiating from and between a number of outer apical points;

each pair of corresponding inner and outer apical points, having a plurality of pairs of elements which radiate therefrom and cross in scissors-like fashion; and

means joining said pairs of elements at their crossing points so as to cause the network to be self-supporting.

3,968,809

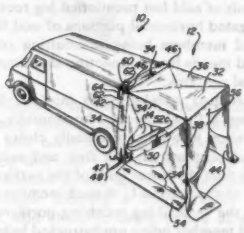
VAN TENT FOR OPEN-ENDED VANS

Allan E. Beavers, Littleton, Colo., assignor to T. A. Peisue Company, Englewood, Colo.

Filed May 27, 1975, Ser. No. 580,932

Int. Cl.² A45F *1/06, 1/16*

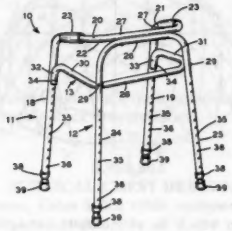
U.S. Cl. 135—4 A **12 Claims**



1. A tent for use in combination with a rear-opening van-type vehicle to form a temporary room-like extension at the rear end thereof which comprises: a first foldable rigid subframe including intersecting diagonally-disposed pairs of jointed struts, a hub located at the intersection of the strut pairs, and stretchable means successively interconnecting the ends of the struts remote from the hub cooperating therewith and with said hub to releasably maintain said frame in an unfolded generally rectangular configuration; means for detachably connecting the first subframe to the upper outside corners at the rear of the van body depending from the front corners of said first subframe; second and third foldable rigid subframes attached to opposite side margins of the first subframe in supporting relation therebeneath; a first fabric panel covering the first subframe and cooperating therewith to define a roof; second and third fabric panels covering the second and third subframes cooperating therewith to produce sidewalls; fabric flaps extending forwardly from the front margins of the roof and sidwall panels into position atop and alongside the van body; and, means carried by the forward edges of the flaps connecting them together and cooperating

therewith to define a retractable cuff sealable against the side and top of the van.

3,968,810
CONVERTIBLE WALKER
Morton I. Thomas, 125 South St., Passaic, N.J. 07055
Filed Nov. 18, 1974, Ser. No. 524,476
Int. Cl.[2] F16M *13/08*
U.S. Cl. 135—45 A **4 Claims**



1. A walker comprising a substantially rigid, stable frame, said frame comprising:

a first U shaped member, said U shaped member comprising a pair of laterally spaced, rearwardly disposed, substantially vertical leg receiving portions, substantially horizontal side arm portions extending forwardly from the upper ends of said vertical leg receiving portions, and a forwardly disposed, horizontal elongated portion connecting the forward ends of said side arm portions;

a second U shaped member, said second U shaped member comprising a pair of laterally spaced, forwardly disposed, substantially vertical leg receiving portions, and a substantially horizontal elongated portion connecting the upper ends of said last mentioned leg receiving portions, the elongated horizontal portions of said first and second U shaped members being in abutting relation to each other and means interconnecting said abutting elongated horizontal portions;

a third U shaped member, said third U shaped member comprising a forwardly and horizontally disposed elongated portion located substantially closer to the abutted horizontal portions of said first and second U shaped members than the lower ends of the vertical leg receiving portions of the second U shaped member with the space between the vertical leg receiving portions of the second U shaped member being unobstructed below the horizontally disposed elongated portion of the third U shaped member, a pair of horizontal side portions respectively extending rearwardly from the opposite ends of said last mentioned elongated portion, and vertical portions of limited length depending from the rear ends of said last mentioned horizontal side portions;

means connecting the depending vertical portions of said third U shaped member to the leg receiving portions of said first U shaped member at points located substantially closer to the side arm portions of the first U shaped member than the lower ends of the vertical leg receiving portions of said first U shaped member;

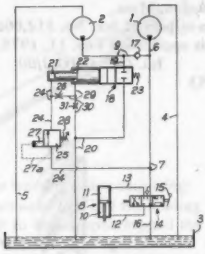
means connecting the elongated portion of said third U shaped member to the leg receiving portions of said second U shaped member at points substantially closer to the abutted horizontal portions of said first and second U shaped member than the lower ends of the vertical leg receiving portions of the second U shaped member;

a set of leg members being received within the leg receiving portions of said first and second U shaped members in relative slidable relation to each other;

and coacting means on said leg receiving portions and said leg members for locking said leg members in adjusted positions relative to said leg receiving portions between the fully extended and the fully retracted positions of said leg members relative to said leg receiving portions; said coacting means extending between the lower ends of said leg receiving portions and the respective means for connecting said third U shaped member;

said leg members and leg receiving portions having correlated linear dimensions which provide (1) use of the walker by an individual having a height as little as 4′4″ when said leg members are fully retracted; and (2) use of the walker by an individual having a height of as much as 6′4″ when said leg members are fully extended.

3,968,811
PRESSURIZED FLUID CONTROL CIRCUIT
Pierre C. Fillion, Nanteuil-le-Haudouin, France, assignor to Societe Anonyme: Poclain, Le-Plessis-Belleville, France
Filed May 9, 1975, Ser. No. 576,049
Claims priority, application France, May 16, 1974, 74.17084
Int. Cl.[2] G05D *16/04*
U.S. Cl. 137—114 **4 Claims**



1. A pressurised fluid control circuit comprising at least one receiving means, a pipe for supplying the receiving means called the main supply pipe, a first pressurised fluid source which is provided with a delivery pipe called the first pipe and connected to the main supply pipe, a second pressurised fluid source provided with a delivery pipe called the second pipe connected to a receiving means, a branch pipe connected on the one hand to the second pipe and on the other to a two-position valve, a first discharge pipe connected to the valve, a first-position regulating member which is coupled to the valve and has a working chamber called the first working chamber which can be connected with a pressurised fluid whose action is opposite to that of a restoring member which is also coupled to the valve, whereby the action of the said restoring member when it predominates is to bring the valve into its first position where the branch pipe is shut off whilst the second position of the valve corresponds to the connection of the branch pipe to the first discharge pipe, a supply pipe for the first working chamber called the first supply pipe connecting the main supply pipe to the first working chamber, whilst on the said first supply pipe is positioned a calibrated relief valve equipped with a member for controlling its opening connected to the first supply pipe between the main supply pipe and the calibrated relief valve, a second discharge pipe connected to the first working chamber and a first constrictor placed between the said second discharge pipe and the first working chamber, wherein this circuit comprises a second position regulating member which is coupled to the valve and comprises a working chamber called the second working chamber which can be made to connect with a pressurised fluid whose effect is also opposite to that of the restoring member, whereby the said second discharge pipe is also connected to the second second working chamber, a supply pipe for the said working chamber called the second supply pipe which links the first working chamber to the second working

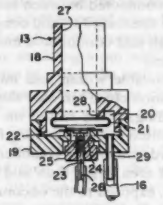
chamber and wherein is provided the first constrictor and a second constrictor placed in the second discharge pipe.

3,968,812

APPARATUS FOR REMOVAL OF CONDENSED MOISTURE FROM RESPIRATORY TUBES

Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,093
Int. Cl.² F16T *1/14*
U.S. Cl. 137—188 **11 Claims**



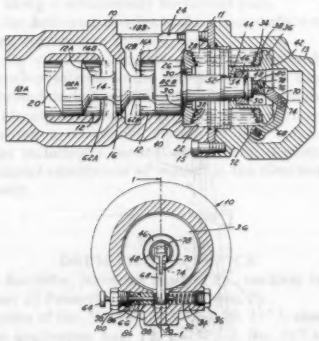
1. Drain valve means for automatically draining condensed moisture from tubing, said valve means comprising a casing having a passage adapted to be connected to the tubing and forming an inlet chamber into which condensed moisture from the tubing may flow by gravity, an outlet chamber with which said inlet chamber communicates at its bottom and an outlet port in said outlet chamber from which moisture may flow by gravity to atmosphere, an annular valve seat at the bottom of said inlet chamber between said inlet and outlet chambers and a resilient hollow disc-like bulb controlling communication between said inlet chamber and said outlet chamber through said valve seat, said disc-like bulb being biased to an expanded position engaging the valve seat and opened by collapsing responsively to a predetermined weight of condensed moisture accumulated thereon.

3,968,813

FLOW SHUT OFF VALVE

Peter B. Olmsted, Traverse City, Mich., assignor to Olmsted Products Company, Traverse City, Mich.

Filed Oct. 9, 1974, Ser. No. 513,216
Int. Cl.² F16K *17/22, 37/00*
U.S. Cl. 137—493 **23 Claims**



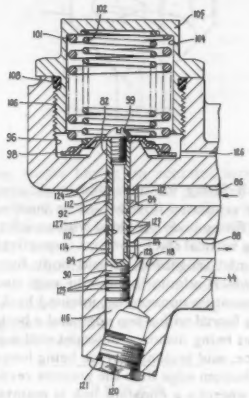
1. Fluid control means comprising a body, a chamber in the body, at least two external ports communicating with the chamber, a spool in the chamber adapted to reciprocate about a neutral position located between the two external ports in response to reversing fluid pressure differentials occurring between the two ports and acting upon the spool thereby displacing the spool to permit fluid communication between the two external ports and exercising the spool to assure operability of the spool in the event of emergency, shut off means on the spool actuateable by the spool to substantially prevent fluid communication between the two ports in response to a fluid pressure differential in excess of the reversing fluid pressure differentials, and, means adapted to provide a cushioned halt to the movement of the spool upon complete shut off.

3,968,814

HYDRAULIC BOOSTER BRAKE PRESSURE REGULATOR

Kenneth B. Swanson, Bannister, and Kenneth D. Jensen, Owosso, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Continuation of Ser. No. 346,854, April 2, 1973, abandoned. This application Jan. 14, 1975, Ser. No. 540,997
Int. Cl.² F16K *17/34, 31/363*
U.S. Cl. 137—505.18 **3 Claims**



1. A pressure regulator comprising a housing, an elongated bore in said housing, spaced fluid inlet and outlet ports communicating with said bore, an elongated plunger slidable in said bore between first and second positions, a plurality of annular grooves formed in and spaced longitudinally of said plunger, said plunger forming a longitudinally extending chamber therein, said chamber being closed at its opposite ends and having first and second passages communicating said chamber with a first one and a second one of said plurality of annular grooves, respectively, closure securement means closing an end of said chamber and connecting a support means to said plunger, a third one of said grooves being disposed between said first and second grooves and forming an open groove seal preventing communication therebetween, a fourth one of said grooves being disposed between one end of said plunger and said first groove, a fifth one of said groves being disposed between the other end of said plunger and said second groove, said fourth and fifth grooves each forming open groove seals preventing communication between the ends of said plunger and said first and second grooves, said first one and second one of said grooves being in communication with said inlet and outlet ports when said plunger is in its first position, a control chamber formed in one end of said bore and being continuously open to said outlet port, resilient means acting on said support means and urging said plunger to said first position with a predetermined force and maintaining said plunger in said first position when the pressure at said outlet is below a predetermined pressure, said plunger being movable to a second position in which said inlet and outlet ports are simultaneously closed by said plunger from communication with said first and second ones of said passages in

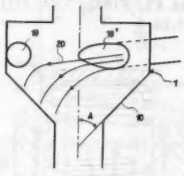
response to a pressure greater than said predetermined pressure at said outlet and in said control chamber acting on said plunger to exert a force greater than the predetermined force of said resilient means.

3,968,815

BRANCH FITTINGS FOR HYDRAULIC STACK APPARATUSES WITH GYROLAMINARY FLOW FOR USE IN BUILDINGS

Monique Legg née Jouve, 3, Avenue Anatole, and Georges Richard, 51, Avenue St-Jerome, both of 13 Aix-en-Provence, France

Filed Dec. 23, 1974, Ser. No. 535,783
Int. Cl.² E03C 1/222
U.S. Cl. 137—602 **6 Claims**



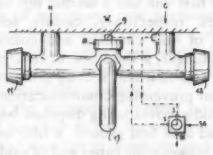
1. A branch fitting for hydraulic stack apparatuses with gyro-laminary ventilated flow for use in buildings, the fitting comprising, a fitting body provided with an inlet and an outlet for connecting vertical stack portions respectively thereto and at least one inlet tangential to said body for connecting a branch-pipe which admits liquid into said stack, said body having a downwardly converging, inlcined braking surface in the shape of a funnel with a top edge and a bottom edge, said tangential inlet being disposed adjacent said top edge of said braking surface, said braking surface being longer between its top edge and bottom edge than the greatest vertical dimension of said inlet, whereby a constant link is maintained between air above the liquid in said branch-pipe and air in said stack.

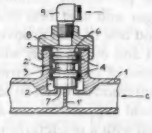
3,968,816

COCK

Elazar Tagansky, 16 Berdichevsky St., Tel Aviv, Israel

Filed Dec. 31, 1974, Ser. No. 537,826
Int. Cl.² F16K 19/00
U.S. Cl. 137—606 **3 Claims**





1. A fluid dispensing apparatus comprising, in combination:

a mixing chamber having a first inlet port and second inlet port, each port introducing a respective fluid stream into said mixing chamber through an opening having a perimeter which defines a valve seat, thereby allowing said fluid stream to mix;

first and second valve means in communication with respective ones of said inlet ports for opening and closing said first and second inlet ports respectively;

output means in fluid communication with said mixing chamber for dispensing said mixed fluid stream;

a communication chamber located adjacent said mixing chamber;

a conduit opening into said communication chamber directly opposite said mixing chamber and connected to one of said inlet ports;

third valve means connected between said conduit and that one of said ports connected to said conduit for controlling fluid flow through said conduit and into said communication chamber; and

a shuttle valve, movable within said mixing chamber and said communication chamber, said shuttle valve having a first face providing, when seated on said seat, a given surface area exposed to the oncoming fluid flow from said inlet ports toward said mixing chamber and a second face having a surface area larger than said given surface area of said first face, exposed to the oncoming fluid flow from said conduit;

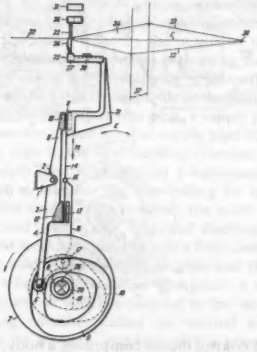
whereby when both faces of said shuttle valve are exposed to a fluid flow, said shuttle valve is forced toward said mixing chamber due to said larger surface area of said second face and closes said output means preventing fluid contained in said mixing chamber from flowing through said output means, and when only said first face is exposed to a fluid stream, said shuttle valve moves away from said mixing chamber, and said output means is opened allowing fluid contained in said mixing chamber to flow through said output means.

3,968,817

METHOD OF AND APPARATUS FOR CONTINUOUS PROGRESSIVE BEATING UP OF WEFT IN TRAVELLING-WAVE SHEDDING LOOMS

Ladislav Bezstarosti; Jaroslav Cizek; Frantisek Jekl, and Lumir Martinek, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Apr. 26, 1971, Ser. No. 137,248
Claims priority, application Czechoslovakia, Apr. 28, 1970, 2939-70
Int. Cl.² D03D 47/26, 49/60, 49/62
U.S. Cl. 139—436 **3 Claims**



1. In a travelling-wave shedding loom provided with means for the simultaneous picking of weft into the warp and affecting the weft in the shed by a beating-up force progressing in

the weaving direction, and apparatus for the beating-up of the weft comprising

a reed divided into sections, the sections consisting of spaced splits, the gaps between the splits serving for the passage of the warp threads,

beating-up projections formed on the splits, the beating-up projections of each section being mutually shifted in such a way that the connecting lines of their homothetic points form straight lines, said straight lines being inclined with respect to the weaving plane and forming with it an acute angle the arms of which open in the weaving direction,

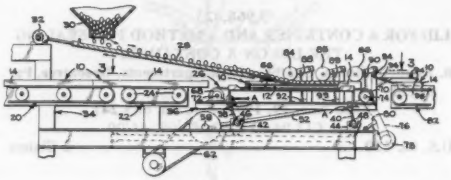
and a mechanism forth driving the sections back and forth and with an upward and downward wave-like motion.

3. A method of continuous progressive beating-up of weft in a travelling-wave shedding loom with simultaneous picking of weft into the warp in which the weft in the shed is affected by a beating-up force progressing in the weaving direction, comprising first affecting the weft by a beating-up force which is the resultant of a force acting in the direction of the weaving plane and another force acting in the direction towards the weaving plane, and then affecting the warp by a beating-up force acting in the direction of the weaving plane, and moving the beating-up force continuously in accordance with the travelling shed waves along the whole warp width.

3,968,818
TRAY LOADING APPARATUS

Alfred W. Gerrans, San Jose, Calif., assignor to Sunsweet Growers, Inc., San Jose, Calif.

Filed Oct. 1, 1971, Ser. No. 185,547
Int. Cl.² B67C *3/02*; B65B *1/20*
U.S. Cl. 141—78 **8 Claims**



1. Apparatus for loading trays with a single layer of articles which comprises

means including a powered belt conveyor for conveying a tray along a substantially horizontal path,

means for delivering articles to the upper surface of the tray during conveyance thereof, and

means for vibrating said tray-conveying means during the delivery of articles to the tray whereby the tray thereon is vibrated during its conveyed movement and the articles are closely compacted thereon, said vibrating means imparting a reciprocal motion to said tray-conveying means including a vertical component of motion and a horizontal component of motion in the direction of conveyance.

3,968,819
DRUM FILLING DEVICE

Henry L. Bachofer, Newtown Square, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 423,343, Dec. 10, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,447
Int. Cl.² B65B *43/42*, *57/00*
U.S. Cl. 141—155 **2 Claims**

1. An apparatus for filling a drum with liquid and for preventing the removal of the drum until the filling apparatus has been completely removed from the drum, comprising:

a. a source of liquid,

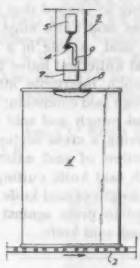
b. a filling assembly connected to the source of liquid comprising:

i. an outer pipe housing having an inverted notch with a detent section,

ii. an inner fill pipe retractably mounted inside the outer pipe housing, and

iii. a retractor handle passing through the notch in the pipe housing and secured to the fill pipe so that when the retractor handle is raised as far as the notch will allow, the fill pipe is completely withdrawn from the drum,

c. means for removing the drum from its fill position beneath the filling assembly, and

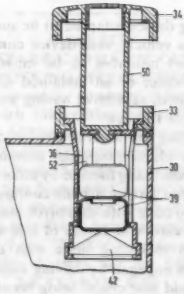


d. switching means having an actuator arm which has a normal position and an actuated position, said switching means mounted on the outside of the pipe housing so that when the retractor handle has been raised to its uppermost limits and rotated into the detent section of the notch, the actuator arm is deflected from its normal position to its actuated position, said switching means being connected to the drum removing means so that the removing means will not operate until the actuator arm is in its actuated position.

3,968,820
MIXING CONTAINER

Walter Kolb, and Dieter Achenbach, both of Betzdorf, Germany, assignors to Wolf-Gerate GmbH, Germany

Filed Apr. 17, 1974, Ser. No. 461,711
Claims priority, application Germany, Apr. 17, 1973, 2319453
Int. Cl.² B65B *1/04*; B65D *25/00*
U.S. Cl. 141—330 **9 Claims**



1. A mixing container for dispensing at least one material contained in at least one capsule into a vessel containing a second material, comprising:

a vessel for containing the second material; said vessel having an open, but closable, filling neck; a sleeve shaped extension projecting into said vessel from said filling neck

to an inner end; said extension having an internal cross section defined by internal walls thereof;

a cutting knife near said extension inner end and located in said extension, and having a cutting edge facing toward said neck; said knife cutting edge extending completely across said extension between its said internal walls, whereby said knife cutting edge is so shaped and of such length and size as to cut completely through a capsule pressed against said knife edge;

at least one capsule positionable in said extension by insertion through said neck and having a width substantially of said extension cross section; said capsule being formed of a material capable of being cut through by a knife edge and said capsule being so shaped that upon said capsule being pressed against said knife edge, said knife slices completely through said capsule in a manner that said capsule can pass said knife and move into said vessel;

a capsule pressing punch insertable into said neck and adapted to pass through said extension; said capsule being located between said punch and said knife; said punch having a portion having a cross section that is substantially said cross section of said extension and that is shaped to meet with said knife cutting edge along substantially the entire length of said knife cutting edge; said punch being adapted to press against said capsule and press said capsule past said knife.

3,968,821

TREE FELLING DEVICE

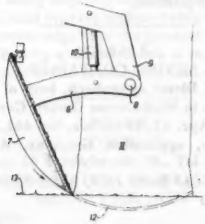
Karl-Erik Arnold Jonsson, Floraplan 14, Gavle, Sweden

Filed May 21, 1975, Ser. No. 579,727

Claims priority, application Sweden, July 24, 1974, 7409613

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 R **4 Claims**



1. A tree felling device adapted to be suspended in a crane beam carried by a vehicle, said device comprising:

a spherical bowl mounted to be moved a limited angle around the center of an imagined sphere in which the bowl is included, said bowl having an outer rim with an annular groove therein;

means for pivoting the bowl around said center;

an endless saw chain extending around said rim of said bowl, said chain being formed by links connected by pivot pins, said chain having a bent configuration in the form of a truncated cone with said pivot pins each extending in directions toward said center of said sphere;

said saw chain including links with depending tongues adapted to be engaged by driving means, said depending tongues of said saw chain being received and guided in said annular groove;

said groove having an inner wall extended to support chain link portions located below and inward of the teeth of said chain; and

at least one sprocket driven by a motor and inserted in a recess at said rim of said bowl and engaging said tongues of said saw chain.

3,968,822

METHOD AND INSTALLATION FOR SAWING TIMBER

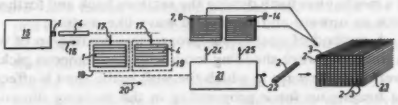
Per Axel Rune Ottosson, and Claes Emil Lennart Otterbeck, both of Nybro, Sweden, assignors to Kahrs Maskiner Aktiebolag, Sweden

Filed Apr. 25, 1974, Ser. No. 464,228

Claims priority, application Sweden, Apr. 27, 1973, 7306009

Int. Cl.² B27B *1/00*

U.S. Cl. 144—312 **2 Claims**



1. A method of sawing logs for obtaining therefrom wooden board stack units of a desired number of boards of a given same cross section within each stack unit comprising the steps of, presorting by diameter a plurality of logs into groups within which each log selected has a sawing yield of a number of boards of a same cross section as a center yield thereof, feeding logs from at least one of said groups to a saw mill for sawing them longitudinally and equal in number to yield a number of boards of a same cross section from a center yield thereof equal to a stack unit of a desired number of boards of a same cross section, and stacking the boards obtained by sawing from said at least one group of logs into a stack unit of said desired number of boards of a same cross section without further sorting.

3,968,823

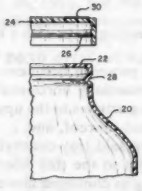
LID FOR A CONTAINER AND A METHOD FOR SEALING THE LID ON A CONTAINER

B. Kenneth Simon, Chatham Park Apartments, Greentree, Pa. 15220

Filed Nov. 19, 1975, Ser. No. 633,241

Int. Cl.² B65D *1/02, 39/00, 41/00*

U.S. Cl. 150—.5 **6 Claims**



1. A lid for a container having an opening comprising a lid having the same contour as the opening, the lid has a continuous ring of electrically conductive material on a top of the lid, the ring follows the contour of the mouth of the container.

3,968,824

PROTECTIVE COVER FOR EXTENDING SHAFTS

John McLoughlin, 92 Mobrey Lane, Smithtown, N.Y. 11787

Filed June 23, 1975, Ser. No. 589,245

Int. Cl.² B65D *59/08*

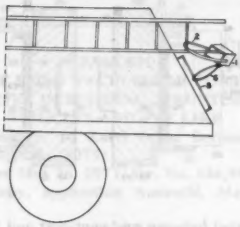
U.S. Cl. 150—52 R **2 Claims**

1. A protective cover for extending shafts comprising;

an enclosure open at one end, said enclosure being padded and being adapted to fit over the end of an extending shaft,

an adjustable mounting strap fixedly connected to one side of said enclosure at one strap end, means to removably connect the other strap end to the opposite side of said enclosure,

and a retaining strap connected to said enclosure, said retaining strap being adapted to be connected to a fixed



object to prevent said enclosure from being lost when said enclosure is removed from said shaft.

3,968,825

VEHICLE WHEELS

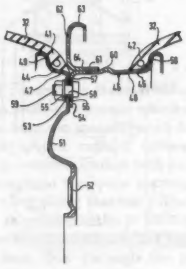
William Eric Mitchell, Coventry, and Reginald Harold Edwards, Sutton Coldfield, both of England, assignors to Dunlop Limited, London, England

Filed Aug. 29, 1973, Ser. No. 392,558

Claims priority, application United Kingdom, Sept. 8, 1972, 41693/72; Mar. 3, 1973, 10444/73

Int. Cl.² B60C *5/00*

U.S. Cl. 152—158 **1 Claim**



1. The assembly of a pneumatic tire and a vehicle wheel, the tire comprising tread and sidewall portions and bead portions at the radially inner peripheries of the sidewall portions; the wheel comprising a disc and a rim, the rim comprising a pair of bead seat portions on which the beads of the tire are respectively seated, a pair of bead support flanges on the axially outer sides of and integral with the bead seat portions and extending radially beyond the bead seat portions adjacent the axially outer sides of the tire beads; a well-less base portion between said bead seat portions, the rim comprising two parts separable in a diametral plane between the bead seat portions to permit tire mounting and dismounting with the base portion being of diameter such as to prevent mounting and dismounting of the tire from the rim without separation of the parts thereof, an annular tire support member separably surrounding the base portion of the rim, said support member comprising a foot portion extending axially of the rim in contact with the base portion, a web portion extending radially outwardly of the base portion of the rim from one end of the foot portion and an annular tire support flange connected at one of its axial ends to the radially outer end of said web portion to extend from said web portion in cantilever fashion generally parallel with the rim axis at a position radially beyond the radially outer ends of the bed support flanges and spaced from the interior of the tire when the latter is in a normal state of inflation, said support flange being positioned to engage and support the inner surface of the tread portion of the tire when the latter is wholly or partially deflated, the two parts of the rim being separable adjacent one of the bead seat portions thereof, the base portion of the rim being formed in the part which comprises the other of said bead seat portions and having intermediate its ends a deformation against which the foot of the support member is locatable to prevent displacement of the support member axially of the base portion between said deformation and the tire bead on said one bead seat portion.

3,968,826

MOUNTING BRACKET FOR A BLIND

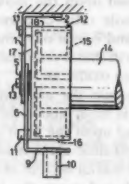
Edwin Zilver, Beethovenlaan, Netherlands, assignor to Silverflex International N.W., London, England

Filed Apr. 15, 1974, Ser. No. 460,978

Claims priority, application Netherlands, Apr. 19, 1973, 7305524

Int. Cl.² E06B *9/08*

U.S. Cl. 160—323 R **7 Claims**



1. In a blind assembly, a blind member, mounting bracket means having separate members, means pivotally interconnecting said bracket members at adjacent ends, one of said bracket members having means at the other end for attachment to a wall, ceiling or like anchorage, means rotatably mounting said blind member on said bracket means substantially coaxially of the pivot axis between said bracket members, a cord reel secured on said blind member adjacent said bracket means, a tubular cage member loosely mounted on said blind member between said reel and said bracket means and having an annular flange extending over the periphery of said reel, and cooperating interengaging means on said cage member and both of said bracket members whereby said cage member may retain said bracket members in any one of a plurality of selected relative angular positions while said bracket means positively limits displacement of said cage member relative to said reel.

3,968,827

METHOD OF PREPARING CERAMIC CASTING MOULDS FOR POURING METAL THEREIN

Jury Leibovich Perevozkin, prospekt Selmash, 36, kv. 81; Anatoly Aramovich Mkrtychian, ulitsa Progressivnaya, 1, kv. 24; Leonid Mikhailovich Baryshevsky, ulitsa Ilicha, 40/26, kv. 22; Vadim Manullovich Livshits, ulitsa Brestskaya, 9a, kv. 10; Daniel Semenovich Meilikhov, ulitsa Volkova, 10/2, kv. 6; Jury Ivanovich Govorov, ulitsa Vorovskogo, 50, kv. 44; Andrei Stepanovich Beschastny, prospekt Selmash, 36, kv. 89, and Fedor Spiridonovich Maximov, prospekt Lenina, 225/1, kv. 37, all of Rostov-na-Donu, U.S.S.R.

Filed Mar. 7, 1975, Ser. No. 556,534

Int. Cl.² B22C *9/00*

U.S. Cl. 164—23 **1 Claim**

1. A method of preparing ceramic casting moulds for pouring metal therein envisaging the following operations: calcining ceramic casting moulds; cooling said moulds to a temperature between 30° and 60°C; applying a particulate material preheated to between 600° and 850°C to the outside of cooled said moulds; compacting said particulate material; keeping the

moulds in said particulate material for a period lasting between 10 and 40 minutes.

3,968,828

METHOD OF CASTING NON-FERROUS ALLOYS

Richard H. Toeniskoetter, Worthington, and John J. Spiwak, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 415,852, Nov. 14, 1973, Pat. No. 3,930,872, which is a continuation of Ser. No. 351,903, April 17, 1973, Pat. No. 3,923,525. This application May 29, 1975, Ser. No. 581,912

Int. Cl.² B22D *21/04*; B22C *1/18*

U.S. Cl. 164—41 **18 Claims**

1. Process for casting relatively low melting point non-ferrous type metals which comprises:

a. fabricating a shape from a composition which comprises a major amount of aggregate and an effective bonding amount up to about 40 percent by weight of the aggregate of a binder composition which comprises:

i. boronated aluminum phosphate containing boron in an amount from about 3 mole percent to about 40 mole percent based upon the moles of aluminum and containing a mole ratio of phosphorus to total moles of aluminum and boron of about 2:1 to about 4:1;

ii. alkaline earth metal material containing alkaline earth metal and an oxide; and

iii. water; wherein the amount of boronated aluminum phosphate is from about 50 to about 95 percent by weight based upon the total weight of aluminum phosphate and alkaline earth material; the amount of alkaline earth material is from about 50 to about 5 percent by weight based upon the total weight of aluminum phosphate and alkaline earth material; the amount of water is from about 15 to about 50 percent by weight based upon the total weight of boronated aluminum phosphate and water; and the aggregate has a particle size large enough to provide sufficient porosity in the foundry shape to permit escape of volatiles from the shape during the casting operation:

b. pouring said relatively low melting point non-ferrous type metal while in the liquid state into said shape;

c. allowing said non-ferrous type metal to cool and solidify;

d. contacting said shape with water in an amount and for a time sufficient to cause degradation of the binder system; and

e. then separating the molded article.

3,968,829

MOLDING APPARATUS WITH SHIELDING MOLD MEMBER

Kunii Nakata, Nagano, and Yoshimasa Kubo, Susaka, both of Japan, assignors to Kabushiki Kaisha Akita, Susaka, Japan

Division of Ser. No. 182,476, Sept. 21, 1971, Pat. No. 3,789,907. This application Mar. 13, 1973, Ser. No. 340,902

Claims priority, application Japan, June 25, 1971, 46-46463

Int. Cl.² B22C *9/02*

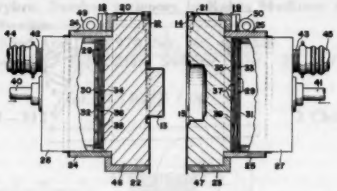
U.S. Cl. 164—160 **1 Claim**

1. A molding apparatus, comprising:

a preformed shielding mold member having at least an outer portion thereof in the shape of a desired mold surface,

a flask having means defining a first opening therein for intimately contacting an inner portion of said shielding mold member; and another opening in said flask for filling heat resistant particulate materials therethrough into the flask between the flask and said shielding mold member; and a vent port for conducting evacuated gases from the interior of the flask so that the particulate materials, which do not include a binding agent, are compressed between said shielding mold member and the flask and are maintained in position in the flask;

means for positively evacuating gases from the interior of said flask so that the interior of the flask is maintained at subatmosheric pressure, said means being connected to said flask through said vent port; and



a filter inserted between said vent port and the interior of said mold, for preventing particulate material from passing through said vent port to said evacuating means.

3,968,830

MOLDING APPARATUS FOR COMPRESSING AND VIBRATING FOUNDRY MOLDS

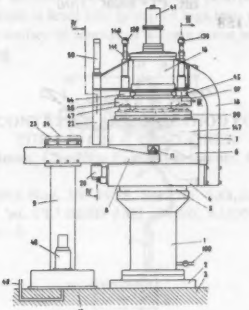
Erwin Bührer, Vogelingasschen 40, Schaffhausen, Switzerland

Filed Nov. 26, 1974, Ser. No. 527,188

Claims priority, application Switzerland, Dec. 6, 1973, 17150/73

Int. Cl.² B22C *15/30*

U.S. Cl. 164—196 **12 Claims**



1. Molding apparatus for squeezing and jolting foundry molds comprising, in combination, a jolting table adapted to have molds placed thereupon, means operatively connected with said jolting table for jolting said table, presser means including a presser plate and pressure applying means located at a spaced distance above said jolting table, said presser means being movable between an uppermost position to permit placement of said molds between said jolting table and said presser plate and a lowermost position for applying a squeezing force to molds placed between said jolting table and said presser plate, arm means located adjacent said table and adapted to have said molds supported thereon, mounting means effecting rotation of said arm means for moving said molds into and out of position between said jolting table and presser plate, and column means extending between said presser means and said jolting table to enable formation of a rigid frame assembly including said jolting table and said presser means, said column means including a first column rigidly interconnecting said presser means with said jolting table and a second column including locking means movable between a locked and an unlocked position, said locking means when in said unlocked position forming a gap between said second column and said jolting table to enable said arm means to be rotated through said gap for placement of said molds between said jolting table and said presser plate, said rigid frame assembly being adapted to be jolted as a unit by

said means for jolting said jolting table while said mold is being squeezed between said jolting table and said presser plate with said locking means in the locked position.

3,968,831

SYSTEM OF USING VACUUM FOR CONTROLLING HEAT TRANSFER IN BUILDING STRUCTURES, MOTOR VEHICLES AND THE LIKE

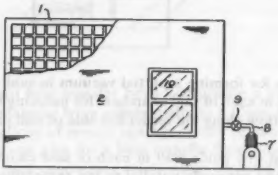
Theodore Xenophou, 16 Karri Drive, Dernancourt, South Australia, Australia (5075)

Filed May 26, 1971, Ser. No. 146,955

Claims priority, application Australia, May 29, 1970, 1347/70

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—1 **2 Claims**



1. The method of controlling thermal transfer in structures occupied by humans, defined by walls which comprises: drawing a partial vacuum between spaced panels forming said walls in conjunction with spaced cellular stiffening members in which the cells are in communication with each other to allow air equalization throughout the space enclosed by said panels and members, and controlling thermal transfer by regulating the vacuum so that thermal transfer is permitted by reducing the vacuum when ambient conditions are required within the structure to allow heat flow through the panels, and then increasing the vacuum to maintain the structure at the selected temperature by decreasing heat flow through the walls of the structure due to the increased vacuum.

3,968,832

APPARATUS FOR CONTROLLING THE TEMPERATURE OF A HEAT EXCHANGE LIQUID

Willy Regenass, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

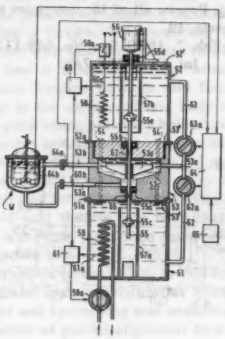
Filed Oct. 25, 1974, Ser. No. 517,986

Claims priority, application Germany, Nov. 2, 1973, 2354997

Int. Cl.[2] F25B *7/00*

U.S. Cl. 165—58 **11 Claims**

1. An apparatus for controlling the temperature of a heat-exchange liquid in accordance with the mixing principle, the apparatus including a centrifugal pump connected to a drive motor for conveying or circulating the liquid in a working circuit, two containers for the liquid, each in a shunt circuit connected via respective shut-off devices to the working circuit, means for maintaining the temperature of the liquid in one container at a given value below the temperature in the working circuit, and the temperature of the liquid in the other container at a given value above the latter temperature and a mechanical propeller-like circulating means in each container, the centrifugal pump being disposed between the two containers and having a pump shaft which extends into both of said containers and is connected to the drive motor, and the



propeller-like means being mounted on the two portions of the pump shaft disposed inside the containers.

3,968,833

METHOD FOR HEAT RECOVERY IN VENTILATION INSTALLATIONS

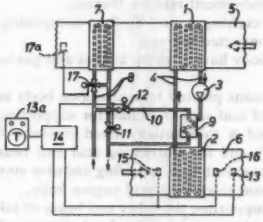
Ove Strindehag, and Roy Holmberg, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 18, 1975, Ser. No. 559,500

Claims priority, application Sweden, Mar. 26, 1964, 7404016

Int. Cl.[2] A23C *3/02*

U.S. Cl. 165—66 **11 Claims**

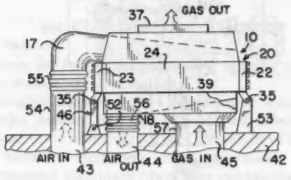


1. A method of increasing the efficiency of heat recovery in heat recovery systems in ventilation installations, comprising at least two heat exchangers, one disposed in the supply air duct and the other disposed in the spent air duct of the installation, a pipe circuit for heat exchange medium interconnecting the heat exchangers and pump means circulating a heat exchange medium through the pipe circuit and the heat exchangers to transfer heat from the spent air to the supply air, characterized in that at low outside temperatures the system is caused to alternate between two modes of operation in such a manner, that during the first mode the temperature of the heat exchange medium passing through the spent air heat exchanger is permitted to decrease to a temperature below the freezing point at which ice is formed from the moisture in the spent air, and a second mode in which the temperature of said heat exchange medium passing through the spent air heat exchanger is controlled to maintain a temperature above the freezing point at which the ice is caused to melt, maintaining said first mode for one period to permit ice to develop, and maintaining said second mode for a second period to effect melting of the developed ice.

3,968,834
HEAT EXCHANGER MOUNTING FOR A TURBINE ENGINE

Ervin E. Mangus, Brimfield; Richard W. Kizer, Morton, and D. Craig Young, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 7, 1975, Ser. No. 548,112
Int. Cl.² F28F 7/00
U.S. Cl. 165—82 **9 Claims**



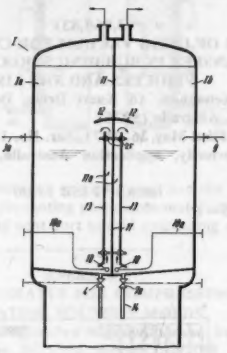
1. In a heat exchanger mounting system for a turbine engine:
   a. a heat exchanger unit comprising an elongated core having opposed upper and lower surfaces, opposed end members and opposed side surfaces, an air-in manifold integrally connected to the upper surface of said core and an air-out manifold integrally connected to the lower surface of said core,
   b. said heat exchanger unit further comprising a support frame surrounding the end members and side surfaces of said core, said support frame having rigid end beams and side members extending between the end beams and secured thereto;
   c. said heat exchanger unit further comprising means for supporting said core in said frame against upward or downward movement relative thereto;
   d. said heat exchanger unit further comprising a gas-in manifold connected thereto,
   e. an engine body having air-in, air-out and gas-in passages therein,
   f. rigid link means pivoted to said engine body and to one end beam of said support frame for supporting said end beam spaced a substantially fixed distance from said engine body and for restraining said end beam against sidewise movement while allowing endwise movement of said end beam relative to said engine body,
   g. means for supporting the other end beam of said support frame spaced a substantially fixed distance from said engine body and for restraining said other end beam against endwise and sidewise movement relative to said engine body,
   h. conduit means, including an expansion bellows therein, connecting and communicating said air-in manifold to and with said air-in passage,
   i. conduit means connecting and communicating said gas-in manifold to and with said gas-in passage.

3,968,835
HEAT EXCHANGER FOR OIL DEODORIZING PLANT

Albert Hartmann, Heusenstamm; Herbert Schilken, Friedberg, and Bernhard Romeiser, Hanau, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 15, 1974, Ser. No. 488,801
Claims priority, application Germany, July 18, 1973, 2336632
Int. Cl.² F28F 13/06
U.S. Cl. 165—108 **6 Claims**

1. A heat exchanger for a pair of liquids, said exchanger comprising:
   a. a generally closed compartment;
   b. a heat-conducting partition wall subdividing said compartment into at least a pair of contiguous chambers each holding a respective liquid;

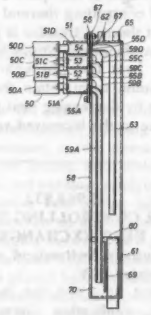


   c. means for forming a partial vacuum in said chambers;
   d. means in each of said chambers for inducing recirculating liquid flow along the respective side of said partition wall; and
   e. at least one guide wall in each of said chambers spaced from and generally parallel to the respective side of said partition wall.

3,968,836
HEAT EXCHANGER

Michael W. Larinoff, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Aug. 5, 1974, Ser. No. 494,471
Int. Cl.² F28B 9/08
U.S. Cl. 165—111 **11 Claims**



1. A heat exchanger, comprising a tube bundle having a plurality of rows of tubes adapted to be arranged successively in the direction of air flow therepast, an inlet header for introducing vapor into one end of the tubes of the rows, a plurality of outlet headers each for receiving condensate and uncondensed vapor from the opposite ends of the tubes of one of said rows, each outlet header having an outlet from the lower end thereof, a generally upright drain pot having an upper portion which surrounds said outlets, a plurality of leg seal tubes each connecting with the outlet from one of the outlet headers and extending into a lower portion of the drain pot, means for maintaining the level of condensate within the drain pot above the lower ends of the leg seal tubes so as to isolate pressures within said outlet headers from one another, and an

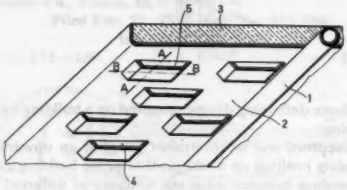
additional tube connecting one outlet header above its lower end with the drain pot above the condensate level therein so as to introduce uncondensed vapor from said one outlet header into said drain pot.

3,968,837

SOUND ABSORBING RADIATING SCREEN

Gyorgy Makara, Budapest, Hungary, assignor to "Futober" Epuletgepeszeti Termekeket Gyarto Vallalat, Budapest, Hungary

Filed Aug. 30, 1974, Ser. No. 502,144
Int. Cl.² F24H *9/08*; F28F *13/00*
U.S. Cl. 165—135 **1 Claim**



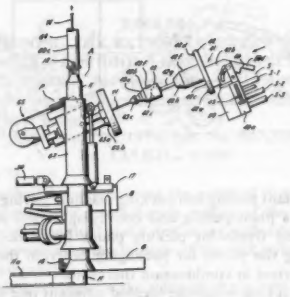
1. A radiant heat-transfer body comprising a plate of heat conductive material lying substantially in a plane and formed with a multiplicity of spaced apart generally rectangular openings; at least one pipe for a heat-transfer fluid bonded to said plate and in heat conducting relationship therewith; a body of thermally insulated and heat absorptive in contact with one side of said plate and substantially coextensive therewith, said body being exposed at said openings; and respective walls spaced from the opposite side of said plate and overlying each of said openings parallel to the plane of the plate, and respective webs on opposite ends of each of said walls connecting same with said plate along opposite edges of each respective opening whereby the webs and wall at each opening frame a pair of slots opening laterally between each wall and the body of insulating material, said slots opening in directions perpendicular to the longitudinal dimension of said pipe.

3,968,838

UNDERWATER CONNECTION APPARATUS

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Division of Ser. No. 386,431, Aug. 7, 1973, Pat. No. 3,866,677.
This application Nov. 25, 1974, Ser. No. 526,465
Int. Cl.² E21B *33/035*
U.S. Cl. 166—.6 **15 Claims**



1. Apparatus for running an underwater flowline to a desired landing point, comprising:

an underwater flowline extending from a remote point to a position near a desired landing point;

a flowline positioning assembly for lowering from the surface of a body of water downwardly to a position in proximity to said desired landing point;

said flowline positioning assembly including a funnel assembly having a flexible line extending therethrough into attachment with said underwater flowline such that the flexible line is extendable from attachment with said underwater flowline through said funnel assembly and upwardly to the surface of said body of water with said flowline positioning assembly being lowered to said position adjacent said desired landing point;

said funnel assembly including control means for directing the travel of said underwater flowline into initial attachment with said funnel assembly in response to the manipulation of said flexible line such that said underwater flowline is partially positioned with respect to said desired landing point; and

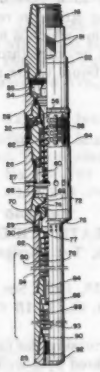
remotely operable power means in said funnel assembly for engaging said underwater flowline in a position of partial alignment and for moving said underwater flowline from said position of partial alignment to a position wherein said underwater flowline is fully aligned with respect to said desired landing point.

3,968,839

SUBSURFACE FLOW CONTROL APPARATUS

Patrick S. Swihart, Sr., 3507 Baumann, Midland, Tex. 79701

Filed Mar. 21, 1975, Ser. No. 560,350
Int. Cl.² E21B *43/00*, *47/06*
U.S. Cl. 166—250 **15 Claims**



1. In a borehole having a fluid producing formation located downhole therein, and a production tubing extending downhole into proximity of the formation, with the tubing forming a produced fluid flow path and a borehole annulus, the improvement comprising:

a subsurface flow controller for controlling flow of fluid from the formation into the tubing string, said controller being in the form of a fluid-conducting hollow body and having an upper and lower end portion, said hollow body having means forming a piston chamber, a production inlet chamber, and a production outlet chamber therewithin;

said piston chamber having a piston reciprocatingly received therewithin and dividing the last said chamber into an upper and a lower piston chamber;

a pilot valve means actuated in response to downhole pressure for controlling produced fluid flow into and out of said lower piston chamber;

a production valve seat separating said production outlet chamber from said production inlet chamber, a production valve element having means by which it is actuated by said piston from an opened to a closed position for controlling fluid flow through said production valve seat; a choke forming a produced fluid inlet into said production inlet chamber; means forming a bleed port which is arranged respective to the piston so that downhole pressure is effected within said upper piston chamber when said production valve is closed and which is effected within said lower chamber when said production valve is moved to the open position; and means biasing said production valve element towards the closed position;

so that increased bottomhole pressure opens said pilot valve to cause said piston to open said production valve element, so that fluid flow can occur through said production valve seat until a reduced flow rate through the last said seat causes the production valve element to assume a closed position.

9. Method of controlling mixed liquid and gaseous fluid flow from a producing formation located downhole in the borehole, wherein the produced fluid flows uphole through a production tubing string, comprising the steps of:

1. locating a flow controller downhole in a borehole in proximity of the production formation;
2. connecting the flow controller to the tubing string so that fluid flow through the tubing string is controlled by the action of the controller;
3. sensing the formation pressure and moving the flow controller to a fluid flow position in response to the bottomhole pressure increasing to a value which will expel most of the accumulated liquid from the borehole;
4. sensing the flow rate through the tubing string and moving the controller to a position to prevent fluid flow through the tubing string in response to the flow rate decreasing to a value which is in excess of a rate of flow where insufficient velocity through the tubing string is available to carry liquid to the surface by entrainment.

3,968,840

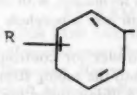
CONTROLLED RATE ACIDIZATION PROCESS

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 25, 1973, Ser. No. 363,934
Int. Cl.² E21B *43/26*
U.S. Cl. 166—280 **6 Claims**

1. A process for increasing the productivity of a subterranean formation penetrated by a wellbore comprising

forcing a fracturing fluid into the formation under sufficient pressure to fracture the formation wherein the fracturing fluid has suspended therein a solid acidic material of the formula:



wherein *n* is 1 or 2 and R is NH_2, —Cl, —OH, $—NO_2$, alkyl, carboxyl or ether which will slowly dissolve upon contact with sufficient aqueous medium and attack the formation and,

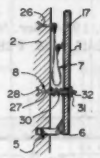
displacing the fracturing fluid and suspended solid acidic material into the fractured formation.

3,968,841

FLAME DEFLECTING DEVICE FOR MOUNTING ON A BUILDING EXTERIOR

Tibor Z. Harmathy, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed June 4, 1975, Ser. No. 583,518
Int. Cl.² A62C *7/00*
U.S. Cl. 169—48 **5 Claims**



1. A flame deflecting device mounted on a building exterior, comprising:

a. a fireproof and weatherproof panel in an upwardly extending position on a side portion of the building exterior extending between adjacent windows at different levels and with the panel extending in a horizontal direction beyond the extremities of the said adjacent windows and in an upward direction extending at least three feet,

b. mounting means pivotally mounting the panel on the building exterior in the upwardly extending position, so that the panel may turn from the upwardly extending position to a substantially horizontally extending position,

c. holding means by which the panel is held against turning any further than the substantially horizontally extending position, and

d. securing means releasably securing the panel in the upwardly extending position, and whereby,

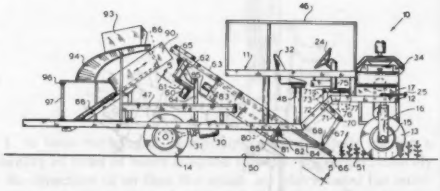
e. when the panel is thus mounted, held and secured in the upwardly extending position to the portion of a building exterior, the securing means may be actuated for the panel to turn to the substantially horizontally extending position to deflect flames, issuing from the window immediately beneath the panel, from the adjacent window immediately above the panel.

3,968,842

TOMATO PLANT HARVESTING APPARATUS

Erwin F. Puch, Sr., and Erwin F. Puch, Jr., both of P.O. Box 3043, Orlando, Fla. 32802

Filed Apr. 7, 1975, Ser. No. 566,028
Int. Cl.² A01D *19/12*
U.S. Cl. 171—11 **21 Claims**



13. In a plant pulling and packing machine having a wheeled frame and a plant pulling and conveying means attached to said wheeled frame for picking plants from the earth and transporting the plants for packaging, wherein the improvement comprises in combination therewith:

a plant packing magazine located adjacent one end of said plant conveying means for receiving plants being picked and conveyed, said packing magazine having a receiving container and a backing plate located therein whereby

received plants in said magazine are compressed against said backing plate;

backing plate actuating means attached to said backing plate for shifting said backing plate in said magazine responsive to predetermined pressure thereagainst by plants being received therein; and

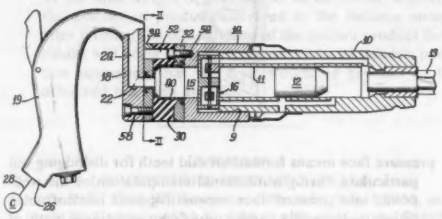
means for removing said plants from said magazine into packaging containers.

3,968,843

PNEUMATIC PERCUSSION TOOL HAVING A VIBRATION DAMPENED HANDLE

Daniel B. Shotwell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 21, 1975, Ser. No. 551,796
Int. Cl.² B25D 9/04
U.S. Cl. 173—139 **17 Claims**



1. A portable pneumatic percussion tool having a barrel; pneumatically actuated apparatus in the barrel; a vibration-dampened handle secured at one end of the barrel and including a hand-grasping section having an air pressure supply passage therein; a cushion member of resilient rubber disposed between the handle and barrel; a pair of metal plate coupling members each on opposite sides of the cushion member and each bonded thereto; the coupling members and cushion member having aligned air pressure supply passages extending therethrough; a unitary, oil-resistant, one-piece, resilient linear which completely lines the air supply passages of said members; the resilient liner having first and second integral flanges extending laterally along the outer face of each coupling member and circumjacent the air pressure supply passage; each flange having an outer face extending beyond the adjacent outer face of the coupling member to provide an annular sealing gasket between each respective coupling member and its adjacent handle and barrel; and means for securing each respective coupling member to its adjacent handle and barrel with the annular sealing gasket compressed sufficiently to provide an airtight seal.

3,968,844

DETERMINING THE EXTENT OF ENTRY OF FLUIDS INTO A BOREHOLE DURING DRILLING

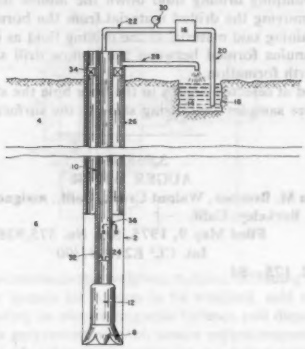
Herbert C. Walther, Jr., Ponca City, Okla., and George M. Myers, Houston, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sept. 19, 1974, Ser. No. 507,320
Int. Cl.³ E21B 47/00
U.S. Cl. 175—48 **4 Claims**

1. A method for determining the entry of formation fluids into the borehole of a well during drilling of the well using a circulating drilling fluid and a drill string with a back pressure valve positioned near the bottom of the drill string above the drill bit comprising:

a. providing a bypass in the sidewall of the drill string above the back pressure valve, said bypass providing fluid pressure communication between the interior of the drill string and the annulus between the drill pipe and the borehole;

b. circulating drilling fluid down the drill pipe and back up said annulus during drilling thereby producing formation cuttings which are carried to the surface by said circulating fluid, said formation cuttings providing, in the absence of entry of formation fluids into the borehole, a returning circulating fluid of greater density than the density of the circulating fluid in said drill pipe;



c. stopping the circulation of drilling fluid in the borehole;

d. determining the pressure in the drill string downstream from the pump used to circulate the drilling fluid, said pressure reflecting the difference in density of circulating fluid in the borehole annulus and in the drill string; and

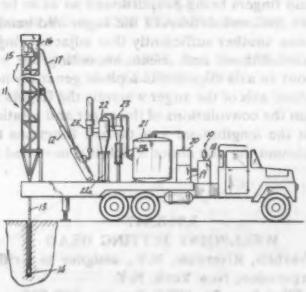
e. comparing the so-determined pressure with previous pressure determinations made using similar steps.

3,968,845

APPARATUS AND METHOD FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Division of Ser. No. 323,852, Jan. 15, 1973, Pat. No. 3,887,020, which is a continuation-in-part of Ser. No. 132,001, April 7, 1971, abandoned. This application Mar. 6, 1975, Ser. No. 555,784
Int. Cl.² E21B 49/00
U.S. Cl. 175—60 **4 Claims**



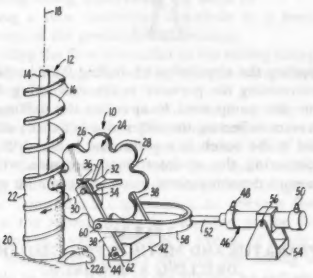
1. A method of drilling in wet, dry, or caving formations with near 100% geologic sample recovery in dry formation and taking core samples in wet formation comprising the steps of:

A. forming a continuous bore hole in the earth by drilling with a hollow stem rotary drill;

B. removing the drilled material from the bore hole in dry formation by entraining the drilling material in a current of air rising in the drill stem created by a vacuum applied to the top of the drill stem;

C. guiding the drilled material from the drill stem to a separator and collecting means;
D. separating the drilled material from the air;
E. collecting the drilled material;
F. and, when wet formation or the depth limit of the vacuum is reached, the steps of disconnecting the vacuum from the drill stem;
G. connecting a drilling fluid pump to the hollow drill stem;
H. pumping drilling fluid down the hollow drill stem and removing the drilled material from the bore hole by entraining said material in the drilling fluid as it rises in the annulus formed between the hollow drill stem and the earth formation;
I. and at selected depths in the bore hole the step of taking core samples and raising same to the surface.

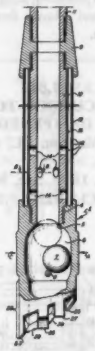
3,968,846
AUGER WIPER
Gordon M. Brenner, Walnut Creek, Calif., assignor to M.G.B., Inc., Berkeley, Calif.
Filed May 9, 1975, Ser. No. 575,938
Int. Cl.² E21B *41/00*
U.S. Cl. 175—84 **5 Claims**



1. In combination with a continuous flight auger having a longitudinal axis with convolutions extending therearound for the transport of drilled debris longitudinally of the auger, an improved wiper for removing debris from the convolutions of the auger, said wiper comprising a wheel having radially extending fingers disposed therearound at uniformly spaced intervals, said fingers being proportioned so as to be engageable between the convolutions of the auger and being spaced relative to one another sufficiently that adjacent fingers may span the convolutions; and, means mounting the wheel for rotation about an axis disposed in a plane generally normal to the longitudinal axis of the auger whereby the fingers interdigitate between the convolutions of the auger and rotation of the auger about the longitudinal axis thereof functions to rotate the wheel around the axis about which it is mounted for rotation.

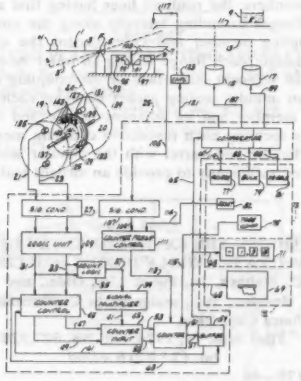
3,968,847
WELLPOINT JETTING HEAD
David A. Werblin, Riverdale, N.Y., assignor to Griffin Wellpoint Corporation, New York, N.Y.
Filed June 26, 1975, Ser. No. 590,508
Int. Cl.² E21B *17/14*
U.S. Cl. 175—402 **5 Claims**

1. A jetting nozzle head for use in a wellpoint device having a fluid delivery means to jet soil immediately in advance of said nozzle head, comprising:
means defining a nozzle adapted to be secured to the lower end of a wellpoint for receiving a passage of fluid under pressure therefrom;
a plurality of spade-like teeth annularly positioned at the forward end of said nozzle means and projecting longitudinally therefrom, said teeth terminating in a cutting surface defining a cutting plane canted with respect to the longitudinal axis of said nozzle means; and



pressure face means formed on said teeth for dislodging soil particulate during a rotational manipulation of the wellpoint, said pressure face means disposed to confront a tilting, side-to-side, and up-or-down rotational path of said teeth during said manipulation.

3,968,848
DIGITAL WEIGHING APPARATUS
Dale M. Cherney, Howards Grove; Charles G. Hart, and Richard W. Safranski, both of Sheboygan, all of Wis., assignors to Hayssen Manufacturing Co., Sheboygan, Wis.
Filed July 28, 1975, Ser. No. 599,837
Int. Cl.² G01G *13/02, 23/18*
U.S. Cl. 177—123 **18 Claims**



1. Apparatus for feeding a product to a weighing scale and stopping the feed when the amount of product fed reaches a final weight comprising:
a scale having balance means, adapted to receive product to be weighed and movable from an initial position toward a balance position as product is delivered thereto, said balance means starting to move upon delivery thereto of a predetermined initial weight of product;

first and second product feed means activated at the start of a weighing operation for delivering a quantity of product from a source thereof to the balance means, the first means delivering product at a first rate of speed and the second means delivering product at a second and slower rate of speed;

means for sensing movement of the balance means in either of two directions and for providing first and second electrical outputs representative of the magnitude and direction of movement thereof, each output always having one of two discrete states; and

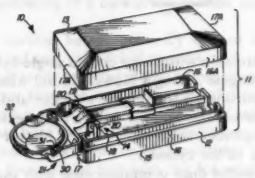
control means responsive to the sensing means outputs for terminating operation of the first product feed means when the amount of product delivered to the balance means reaches a first predetermined level and for terminating operation of the second product feed means when the amount of product delivered to the balance means reaches a second predetermined level substantially equal to the final weight of product to be delivered, whereby the amount of product delivered to the balance means after termination of operation of the second product feed means will bring the balance means into its balance position indicating that the final weight of product to be delivered has been attained.

3,968,849

LIGHTWEIGHT PORTABLE SCALE

John D. Dale, 1211 W. Rovey Ave., Phoenix, Ariz. 85013, and David G. Knotter, 4634 N. 44th St., Phoenix, Ariz. 85018

Filed Aug. 27, 1975, Ser. No. 608,231
Int. Cl.² G01G *21/28*
U.S. Cl. 177—127 **7 Claims**



1. A lightweight miniaturized portable scale comprising:

a carrying case comprising a base portion and a cover portion,

a pair of shaft support members spacedly mounted within said base portion and arranged to extend laterally of the longitudinal axis of said base portion each adjacent a different side thereof,

a collapsible weighing mechanism comprising a yoke portion having a pair of spaced arms, a scale portion and a shaft,

said shaft being non-rotatively attached to said yoke portion with each end fulcrumed on a different one of said support members,

said scale portion being pivotally mounted on said shaft and comprising interference means for engaging said yoke portion and for transmitting given rotative movement of said yoke portion to said scale portion,

a scale having indicia thereon mounted on said scale portion along its length,

a slide member slidably mounted on said scale portion, and

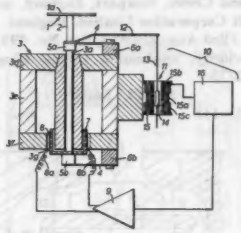
a cup fulcrumed between said arms of said yoke portion for holding the substance to be weighed.

3,968,850

ELECTROMAGNET WEIGHING BALANCE

Charles David Sinclair Gaskill, Haslingden, England, assignor to International Electronics Limited, Haslingden, England

Filed Oct. 31, 1974, Ser. No. 519,773
Int. Cl.² G01G *3/14, 7/00, 23/10*
U.S. Cl. 177—210 **11 Claims**



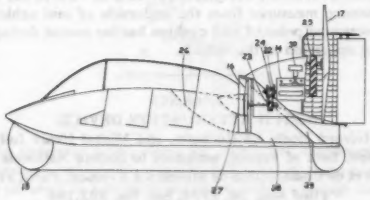
1. In an electromagnetic weighing balance including a movable support system for a mass to be weighed, said support system including an electromagnetic balance coil disposed in the field of a permanent magnet, sensor means responsive to displacement of said support system from a datum position to develop a control signal representative of said displacement, a signal-controlled current source feeding to said balance coil a balancing current producing on said support system a force balancing said mass, balance circuit means fed with said control signal and applying a balancing signal derived therefrom to control said current source, and indicator means responsive to said balancing current to provide a measure of said mass, the improvement which comprises constructing said current source as a high impedance source comprising a transistor (45) having emitter, base and collector electrodes, with said balance coil connected between the collector electrode of said transistor and one terminal of a direct voltage source and the emitter electrode of the transistor returned to the other terminal of said voltage source, and means applying said balancing signal to said transistor base electrode, thereby to control the balancing current supplied to said balance coil.

3,968,851

AUTOMATIC LIFT SYSTEM FOR AIR CUSHION VEHICLES

Robert James Windt, 1204 Third St., Box 281, Cordova, Ill. 61242

Filed Mar. 14, 1975, Ser. No. 558,347
Int. Cl.² B60V *1/14*
U.S. Cl. 180—117 **12 Claims**



1. An air cushion vehicle comprising a body including at least one engine means for driving a lift fan and a propulsion unit, an air intake and lift air duct means for directing lift air to the underside of said vehicle wherein said lift fan is automatically kept running at the proper speed to maintain the correct amount of lift for said vehicle by means of two pulley wheels with movable face plates so as to adjust the effective

diameter of these pulleys and a belt, one of the said pulley wheels being controlled by torque from the lift fan is attached to the lift fan shaft while the other pulley wheel having a spring means to close its face plate is attached to the engine output shaft or power shaft.

3,968,852

STABILIZING MEANS FOR AIR CUSHION VEHICLES

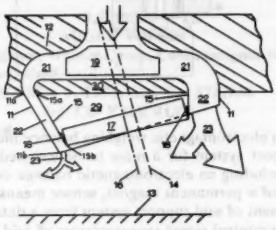
Peter Rowland Crewe, Newport, England, assignor to British Hovercraft Corporation Limited, England

Filed Aug. 5, 1974, Ser. No. 495,054

Claims priority, application United Kingdom, Aug. 15, 1973, 39592/73

Int. Cl.² B60V 1/11

U.S. Cl. 180—118 7 Claims



1. An air-cushion vehicle including means for providing a supporting air cushion, cushion barrier means for sealing said air cushion and at least one stablizing device comprising first and second members formed from endless bands of flexible impermeable material having first edges attached to structure at the underside of the vehicle and extending downwardly therefrom to terminate at second edges, said first member extending around and being spaced from said second member, means on the vehicle for producing a flow of pressurized air which in operation of the vehicle passes downwardly between said first and second members to flow from between the second edges thereof in the form of an air curtain which serves to build up and maintain a localized cushion of pressurized air at a pressure which is higher than that of the air in the vehicle supporting cushion within a space defined by said cushion barrier means, the underside of said vehicle, and a surface over which said vehicle is supported, so that in operation when the height of said vehicle above the surface over which it is operating decreases there is an increase in the pressure of said localized cushion of air which acts between the underside of said vehicle and said surface to produce a stablizing force on the vehicle, the vertical distance measured from said structure at the underside of said vehicle to the second edges of said first and second members being between 25% to 75% of the vertical distance measured from the underside of said vehicle to the lowermost point of said cushion barrier means during the normal operation of the vehicle.

3,968,853

NOTCH ATTENUATION DEVICE

René Gérard Hoch, La Rochette, and Michel Henri Julliand, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Aug. 30, 1974, Ser. No. 502,198

Claims priority, application France, Aug. 31, 1973, 73.31582

Int. Cl.² B64D 33/06

U.S. Cl. 181—33 C 5 Claims

1. In a jet propulsion system comprising a main unsilenced exhaust nozzle having an endless outlet edge, a method for masking, in a given transversal direction with respect to said main nozzle, the noise emitted by said main nozzle, said masking method comprising the step of arranging in spaced offset relation to said main nozzle in said given transversal direction, an auxiliary exhaust nozzle less noisy than said main unsilenced exhaust nozzle in said given transversal direction and having an outlet edge located out of contact with the endless outlet edge of said main nozzle and interrupted by a single notch facing said given transversal direction.

3,968,854

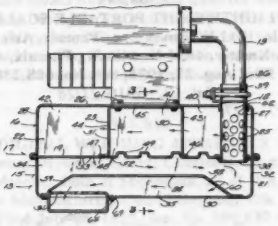
LOW NOISE LEVEL MUFFLER FOR SMALL ENGINES

Douglas Gordon, Hartford, and Richard W. Seilenbinder, Milwaukee, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 18, 1975, Ser. No. 559,567

Int. Cl.² F01N 7/10

U.S. Cl. 181—40 8 Claims



1. In combination with an air cooled single-cylinder internal combustion engine having a blower shroud which embraces a substantial portion of the engine cylinder and which guides cooling air across the cylinder from a fly-wheel blower at one side of the cylinder to an outlet in the blower shroud at the opposite side of the cylinder:

A. an air outlet duct communicated with the outlet in the blower shroud and extending away from the same;

B. a muffler having

1 an elongated shell with substantially parallel front and rear shell walls that extend lengthwise of the shell,

2 an exhaust gas inlet port in the rear of the shell, near one end thereof, communicated by means of an exhaust gas duct with an exhaust outlet of the engine, and

3 an exhaust outlet port in the front of the shell, near the opposite end thereof;

C. means mounting said muffler in the air outlet duct so that the muffler can be swept by the stream of cooling air that has been blown across the engine cylinder;

D. means defining front and rear partition walls in the interior of the muffler shell that are parallel to said front and rear shell walls and are spaced from them and from one another, to divide the interior of the muffler into three gas passages, each of which extends along a substantial portion of the length of the muffler, each said partition wall being apertured near the end of the shell remote from its adjacent port in the shell so that gas is constrained to flow lengthwise in succession through said passages in passing from said inlet port to said outlet port;

E. a substantially U-shaped partition member confined between the rear shell wall and the rear partition wall,

1 the legs of said U-shaped member comprising apertured dividers which extend across the rear gas passage and

divide it into three cmpartments that are communicated with one another through the apertures in said dividers, and

2 the bight portions of said U-shaped member flatwise overlying the inner surface of the rear shell wall, said partition member thus serving both to disrupt gas flow through the rear gas passage and to transfer heat to said rear shell wall from the rear partition wall; and

F. the front partition wall comprising a pan-like member which has a substantially wide rim portion that flatwise overlies the inner surface of the front shell wall to reinforce the same and transfer heat thereto.

3,968,855

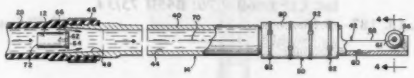
SEISMIC MARINE GUN ASSEMBLY

John C. Mollere, Nassay Bay, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 115,361, Feb. 16, 1971, abandoned, and a continuation of Ser. No. 354,270, April 25, 1973, abandoned. This application Jan. 13, 1975, Ser. No. 540,363

Int. Cl.² G01V *1/38*; F42D *3/06*

U.S. Cl. 181—118 **6 Claims**



1. An underwater gun assembly for marine seismic exploration, into which, during operation, explosive-charged cylindrical cartridges are propelled by water under pressure flowing through a flexible conduit coupled to the gun assembly, comprising in combination:

A. a cylindrical firing gun having near its end a percussion element;

B. a barrel consisting of a cylindrical section and of a conical section,

said conical section being forwardly of and tapering inwardly toward said cylindrical section, and

said cylindrical section having a bore whose diameter is only slightly larger than the outer diameter of a cartridge and whose length is a multiple of the length of said cartridge, whereby said bore provides a sufficiently-long, alignment-and-acceleration passage for said cartridge to align the cartridge's longitudinal axis with the longitudinal axis of said cylindrical section, and to propel the cartridge into the firing gun with a predetermined acceleration for the proper initiation of said cartridge by said firing gun; and

C. coupling means detachably coupling the cylindrical section of said barrel forwardly of and in abutting coaxial engagement with said cylindrical firing gun.

3,968,856

SPIRAL SLIDE FIRE ESCAPE

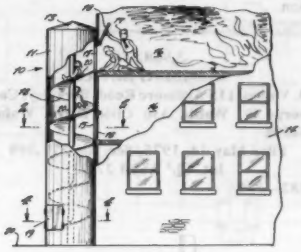
Warren L. Keen, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 7, 1974, Ser. No. 495,444

Int. Cl.² A62B *1/20*

U.S. Cl. 182—48 **1 Claim**

1. A spiral fire escape, comprising a vertical tube containing a spiral slide, said tube being mounted adjacent a vertical wall forming the sides of vertically aligned rooms, including an access door from each room and a corresponding adjacent aligned doorway formed through said tube, wherein corresponding aligned doors and doorways are of equal vertical dimension and are disposed between spaced adjacent portions of said slide providing unobstructed access into said slide, in further combination with a hinged exit door at the slide bottom, said door including a latch mounted slidably on the inside of said door, said latch being slidable from a normally locked position to an open position by means resiliently retaining the latch in the locked position in combination with a lever pivotally mounted on said door engaging said means, said lever being normally in a position corresponding to the locked position of said latch and movable to position causing said means to move the latch to said open position upon impact of a person descending from said slide wherein the exit door comprises adjacent similar portions pivotable about vertical



axis having opposing brackets with vertically aligned holes, said latch having a rod normally extending through said holes and an upper end in engagement with said means, wherein said lever is pivotally mounted about a horizontal pin on said door and includes a lower impact bumper facing the escaping person, said means comprising a leaf spring engaging the bumper at one end and the upper end of said rod at the opposite end of the spring.

3,968,857

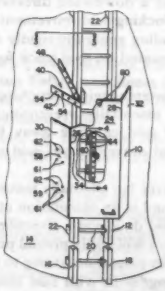
DEVICE FOR PREVENTING UNAUTHORIZED ACCESS TO PERMANENT LADDERS

Robin R. Bryan, 5007 Orchard Ridge Lane, Greensboro, N.C. 27405

Filed Feb. 20, 1975, Ser. No. 551,076

Int. Cl.² E06C *5/32*

U.S. Cl. 182—106 **5 Claims**



1. An improved safety shield for permanent ladders of the type having a pair of side rails and a plurality of rungs permanently secured to a support structure such as storage tanks, smoke stacks, television towers, tall buildings, bins and silos, said shield comprising:

a. a front plate having two longitudinal side edges;

b. a pair of side flanges, each of which extends rearwardly and outwardly from one of said side edges in angular relationship thereto to a point substantially adjacent said support structure;

c. a hinge means connecting a first of said side flanges and said front plate along juxtaposed side edges;

d. at least one support bracket for connecting said first side flange to said ladder, said first side flange substantially abutting said support structure;

e. said front plate being movable between a first open position and a second closed position wherein said front plate, side flanges, and supporting structure substantially enclose said ladder and the second side flange substantially abut said support structure to prevent unauthorized access thereto; and

f. locking means for securing said front plate in said closed position.

3,968,858

CLIMBING DEVICE

Douglas D. Vollan, 115 Ardmore Road, Berkeley, Calif. 94707, and George W. Walsh, 330 Civic Drive, Walnut Creek, Calif. 94596

Filed May 14, 1975, Ser. No. 577,399
Int. Cl.[2] A63B 27/02
U.S. Cl. 182—135 **7 Claims**

1. Apparatus responsive to the weight of a human operator tending to move in a downward direction along a generally vertical path by blocking said movement comprising:

A. a track extending generally rigidly along said path;

B. a carriage mounted on said track for slidable movement therealong;

C. cooperable interengaging structures on said track and said carriage essentially preventing outward transverse movement of said carriage away from said track and circumferential movement of said carriage around said track;

D. a blocking lever bar pivotally mounted on said carriage at a location and in an orientation at which upon tending to move in said downward direction said weight of said human operator will apply pivotal pressure to said bar on a first side of its pivotal mounting to said carriage causing frictional engagement with said track of its end on the opposite side of said pivotal mounting, whereby movement of said human operator downward is resisted by said blocking lever bar;

1. said lever bar having a length on the opposite side of said pivotal mounting which is greater than the distance between said pivotal mounting and said track, the distance from said pivotal mounting on the location at which the weight of said human operator applies pressure to said bar on said first side being greater than the distance between said pivotal mounting and said end of said bar on said opposite side, whereby said frictional engagement in response to said application of the weight of a human operator will be provided with leverage pressure; and

2. said blocking lever bar being pivotally mounted for movement in the direction opposite to that at which said weight of said human operator will apply pressure thereagainst in order to release said frictional engagement with said track of the end of said bar on the opposite side of said pivotal mounting, whereby said carriage is free for slidable movement along said track; and

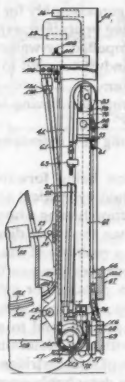
E. means adapting said lever bar for supporting the weight of a human operator, said means including a foot platform secured to said bar on said first side of its pivotal mounting and a retaining member for maintaining said platform in engagement with any foot thereon upon said foot moving in said opposite direction to release said frictional engagement of said end of said lever bar with said track, said foot platform and retaining member being sized to accommodate both feet of an operator.

3,968,859

MULTIPLE HOSE GUIDE ARRANGEMENT FOR A LIFT TRUCK

Benonie C. Ehrhardt, Park Forest, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 23, 1974, Ser. No. 536,029
Int. Cl.[2] B66B 9/20; B65H 75/34
U.S. Cl. 187—9 E **18 Claims**



1. In a lift truck of the type having a mast, a carriage mounted on the mast for vertical movement at the front of the latter and a vertically disposed hydraulic lift jack for raising and lowering said carriage on said mast, the combination comprising:

a first pulley mounted on the upper end of said jack for rotation about a horizontal transverse axis,

an elongated flexible load support member trained over said first pulley and having its opposite ends connected to said carriage and mast,

a second pulley rotatably mounted on the upper end of said jack in a position above said first pulley and on a horizontal axis lying in a vertical plane disposed at an acute angle to said axis of said first pulley, and

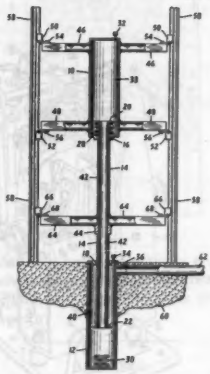
a pair of flexible conduits for independently conveying hydraulic fluid between said carriage and said truck trained over said second pulley in one on top of the other relationship and extending downwardly at the front of said jack on one lateral side of said flexible load support member.

3,968,860

HYDRAULIC ELEVATOR INSTALLATION

Richard E. Atkey, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Oct. 25, 1974, Ser. No. 514,893
Int. Cl.² B66B 9/04
U.S. Cl. 187—17 1 Claim



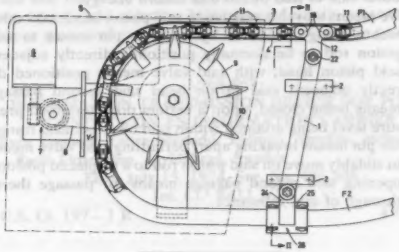
1. An hydraulic elevator installation for vertically transporting an elevator cab up and down in a hoistway, comprising a source of hydraulic fluid; a fluid pressure responsive hydraulic jack including a first cylinder fixedly mounted in a vertical position, said first cylinder having an inlet connected to said source of hydraulic fluid for receiving hydraulic fluid therefrom, a plunger, said plunger having a first end slidably mounted within said first cylinder for vertical reciprocating movement therein, a second end and an axial bore forming a passageway for hydraulic fluid, and a second cylinder slidably mounted about said second end of said plunger for vertical reciprocating movement thereon, wherein said bore has an inlet located at said first end of said plunger and communicating with said first cylinder for receiving hydraulic fluid supplied to said first cylinder and an outlet located at said second end of said plunger and communicating with said second cylinder for supplying hydraulic fluid to said second cylinder, whereby said second cylinder reciprocates vertically on said plunger under the influence of fluid pressure conditions within said second cylinder and said plunger reciprocates vertically within said first cylinder, at the same velocity at which said second cylinder reciprocates on said plunger, under the influence of fluid pressure conditions within said first cylinder; a lifting frame for carrying the elevator cab, said lifting frame including said second cylinder, a lower horizontal support member rigidly attached to said second cylinder and an upper horizontal support member rigidly attached to said second cylinder and located a predetermined distance above said lower horizontal support member; a pair of parallel guide rails extending upwardly in the hoistway; two pairs of vertically aligned lower and upper guide means carried by said lower and upper horizontal support members, respectively, and engageable with said guide rails for centering said lifting frame between said guide rails during the vertical movement of said lifting frame in the hoistway; a follower guide rigidly attached to said plunger between said first and second cylinders; and a pair of guide means carried by said follower guide and engageable with said guide rails for supporting the portion of said plunger between said first and second cylinders during the vertical movement of said lifting frame in the hoistway.

3,968,861

ELEVATOR

Hans Kernen, Engehaldenstr. 69, 3012 Bern, Switzerland

Filed July 1, 1975, Ser. No. 592,228
Claims priority, application Switzerland, July 9, 1974, 9439/74
Int. Cl.² B66B 11/04
U.S. Cl. 187—17 4 Claims



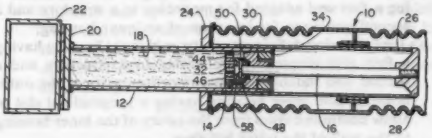
1. An elevator comprising a guide means, a car guided for reciprocating travel along said guide means, transmission means disposed in said guide means and comprising a substantially uninterrupted sequence of transmission members, and a motor drive means provided with teeth for engagement in said transmission means, wherein said guide means comprises two parallel guide tracks of a guide tube endlessly closed upon itself by means of two connecting sections, said guide tube having along its entire length a slot extending along a generatrix thereof, said slot being situated in facing sides of said guide tracks and being narrower in width than the inside diameter of said guide tube, said transmission members are disposed in said guide tube, not connected to one another, are guided by an inside wall of said guide tube, and include a carrier member having a middle portion from which a tongue projects through said slot, the remaining said transmission members being rams each having a middle portion in which there is a slot-like aperture aligned with said slot, and said teeth project through said slot into said guide tube and engage with said rams in the region of one of said connecting sections.

3,968,862

KINETIC ENERGY ABSORBING VALUE ASSEMBLY

Franz A. Gorges, Sun Valley, and James E. Robertson, Woodland Hills, both of Calif., assignors to Menasco Manufacturing Company, Burbank, Calif.

Filed Mar. 20, 1974, Ser. No. 452,920
Int. Cl.² B60R 19/06; B61F 19/04; F16D 63/00; F16F 9/30
U.S. Cl. 188—1 C 1 Claim



1. An energy absorption unit comprising:
a tubular housing having an internal chamber formed therein, said housing having a closed end and an open end;
a substance contained within said chamber being capable of absorbing energy;
a piston movably supported within said chamber;
an orifice means associated with said piston for permitting said substance to move from one side of said piston to the opposite side of said piston to produce a damping resistance force on said piston head;

a piston rod secured to said piston and extends exteriorly of said housing through said open end;

sealing means mounted within said chamber adjacent said open end of said cylinder, said piston rod passing through said sealing means and being movably mounted in respect thereto;

said orifice means comprising first and second passage means, said substance being adapted to move through said first passage means from one side of said piston to the other side of said piston and absorb energy;

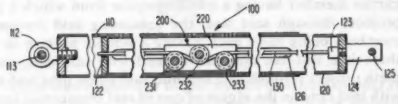
valve means movable relative to said piston head, said valve means being connected by frangible pin means to said piston rod to be normally positioned directly adjacent said piston head, with said valve means positioned directly adjacent said piston head said second passage means being closed, upon a certain predetermined pressure level being attained within said chamber said frangible pin means breaking apart permitting said valve means to slidably move on said piston rod to a displaced position opening said second passage means for passage therethrough of said substance.

3,968,863

ENERGY ATTENUATOR

Mason J. Reilly, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 22, 1975, Ser. No. 615,279
Int. Cl.² F16F 7/12
U.S. Cl. 188—1 C 5 Claims



1. An energy attenuator comprising:

an outer housing defining a cavity, said outer housing having a first end adapted for mounting to a structure and a second end open for insertion of an inner housing;

an inner housing defining a cavity, said inner housing having a first end adapted for mounting to a structure and a second end slidably inserted into the cavity of the outer housing, said inner housing having a longitudinal slot to allow communication from the cavity of the inner housing to the wall of the outer housing;

a wire extending longitudinally through the cavity of the inner housing; fixedly attached to the first and second ends of said inner housing;

wire bending means within the cavity of the inner housing operatively engaging the wire;

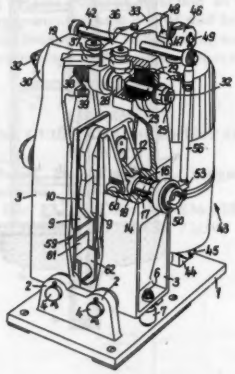
connecting means fixedly attaching the wire bending means to the outer housing, said connecting means passing through the longitudinal slot in the inner housing whereby, as the inner and outer housings move in relation to each other in response to tensile or compressive forces applied to the mounting ends of the housings, energy is expended in bending the wire.

3,968,864

DISC BRAKE, ESPECIALLY FOR CRANE DRIVES

Klaus Deichsel; Hinrich Flessner, and Henricus Theodorus Tromp, all of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 2, 1975, Ser. No. 564,462
Claims priority, application Germany, Apr. 13, 1974, 2418225
Int. Cl.² F16D 55/10, 65/56
U.S. Cl. 188—71.9 14 Claims



1. A disc brake having a pair of arms pivotally supported at one end and adapted to receive the periphery of a brake disc therebetween, means biasing the free ends of said arms toward each other, brake elements on the sides of the arms which face each other, adjustable means connecting said brake elements to said arms for adjustment of brake elements toward each other, a disengaging device including a lever pivotally connected to the free ends of the arms having a nose thereon operable when the lever is pivoted in one direction to press said arms apart, said nose camming out from between said arms when the lever is released, an actuator pivoted on said lever and when moved in one direction abutting said lever and moving said lever in said one direction, a free wheeling one way clutch device connected to each adjustable means, and a link forming a lost motion connection between each free wheeling device and the axis of pivotal connection of said actuator to said lever.

3,968,865

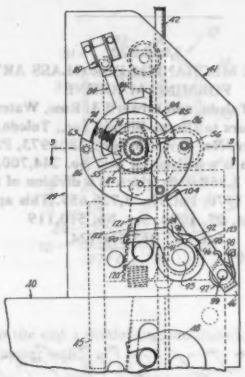
CABLE CLIMBER SAFETY LOCK

Robert C. McElroy, Lisbon, Ohio, assignor to Cable Climber Safety Devices, Incorporated, Lisbon, Ohio

Filed May 20, 1974, Ser. No. 471,646
Int. Cl.² B60T 8/12
U.S. Cl. 188—188 3 Claims

1. In combination with a cable climber, a safety lock including first and second spaced parallel vertically disposed plates, a vertically disposed support cable having a portion thereof positioned between said plates, a displacement solenoid contiguous to said first plate and secured thereto for selectively actuating said cable climber, mounting bars connecting said plates to said cable climber, a sensor for sensing relative movement between said climber and cable, first and second shafts arranged in spaced parallel relation with respect to each other and mounted in said plates, intermeshing gears on said shafts, a sensor drive pulley on said second shaft and said sensor drive pulley being interposed between said plates and having a plurality of serrated notches thereon, said sensor

mounted on said first shaft, a shiftable pulley on the end of said first shaft, resilient means for engaging said shiftable pulley, said solenoid selectively shifting said shiftable pulley,



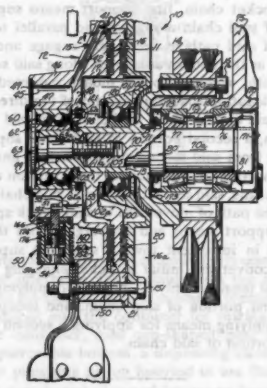
means on said shiftable pulley selectively engaging means on said sensor to drive said sensor from said first shaft on operation of said solenoid, and a positive lock arm contiguous to said overspeed sensor.

3,968,866

FLUID COUPLING

Wayne K. Leichliter; Rodney H. Detty, and John B. Hill, all of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 29, 1974, Ser. No. 528,542
Int. Cl.² F16D *35/00, 43/25, 13/72*
U.S. Cl. 192—58 B **15 Claims**



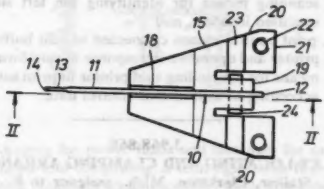
1. A fluid coupling for driving a cooling fan device associated with a vehicle and which is positionable so that ram air impinges directly thereon, said fluid coupling comprising relatively rotatable input and output coupling members, said output coupling member defining a chamber within which said input coupling member rotates, said input and output coupling members having a shear space therebetween and are cooperable with viscous shear fluid in the shear space to transmit torque therebetween, said output member having means defining a reservoir chamber located forwardly of said shear space, means for directing viscous fluid from said shear space into said reservoir chamber including surface portions on one of said members against which said viscous fluid impinges due to rotation of said input member relative to said output member, temperature-responsive valve means for controlling flow of viscous fluid from said reservoir chamber into said shear space and including a temperature-sensing device located forwardly on said output member in the ram air stream, said output member having fan blade mounting pads against which the fan blades are secured, said fan blade mounting pads being located axially between said shear space and said reservoir chamber and being at least in part located radially outwardly of said shear space, a chamber defined by said output member and said fan blade mounting pads and opening into said ram air stream, said chamber being located axially adjacent said shear space and radially inwardly of said mounting pads.

3,968,867

INFORMATION TRANSMISSION DEVICE FOR POINT CONTACT ON AN INFORMATION CARRIER

Sven Gunnar Valter Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed July 15, 1974, Ser. No. 488,806
Int. Cl.² B41J *3/50*
U.S. Cl. 197—1 R **4 Claims**



1. Device for point contact on an information carrier comprising:

a. a frame,

b. an electromagnet,

c. an armature,

d. a leaf spring having said armature mounted thereon,

e. an elongated L-shaped arm formed by two generally perpendicular legs, the outer end of one of said legs being provided with means for engaging said information carrier,

f. the electromagnet co-acting with said armature for moving said other of said legs toward said electromagnet and moving said means on the outer end of said one leg toward said information carrier to provide a dot thereon, and

g. said leaf spring of a generally triangular shape being secured to an inner portion of said one leg, the apex of said triangular-shaped spring being directed toward the means for engaging said information carrier, the base opposite said apex being secured to said frame which is fixed relative to said electromagnet, said leaf spring having a portion of reduced thickness located between said apex and said base for providing the resilient function of said spring.

3,968,868

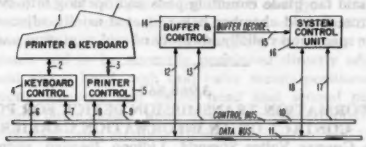
FORMAT CONTROL SYSTEM FOR POSITIONING FINAL COPY PRINTED TEXT

John Charlie Greek, Jr.; Eric Sigfried Petterson; Howard Carl Tanner, all of Austin, and David Wesley Terry, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,184
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **10 Claims**

1. A system for printing final copy printed text at a specified location on a printing line upon a first printing comprising:

a. a printer;
b. a keyboard;
c. mode selection means in said keyboard for selecting the final copy printed text mode of operation;
d. print inhibit means responsive to said mode selection means for inhibiting outputting of data during input keying of data;
e. a buffer communicating with said keyboard for storing format control data and text data keyed on said keyboard; and



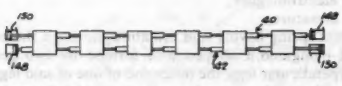
f. logic means operative in response to an end of line signal from said keyboard, said logic means including,
1. means for scanning the data stored in said buffer,
2. format control means operative in response to said scanning means for identifying the left side of said specified location, and
3. print control means connected to said buffer and said printer and operative in response to said format control means for controlling said printer to print said text data according to said format control data.

3,968,869

PALLET LOCATING AND CLAMPING ARRANGEMENT

Neil J. Stalker, Clarkston, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed July 14, 1975, Ser. No. 595,508
Int. Cl.² B23Q *5/22*
U.S. Cl. 198—19 **25 Claims**



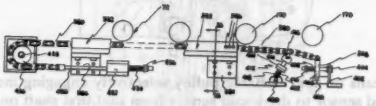
1. In a work piece transfer machine of the type wherein pallet supported work pieces are conveyed to a plurality of successively spaced apart stations at which operations are performed on the work piece, each said station including a locating pin movable from a retracted position to an operative position engaging the pallet to precisely locate it at the station and also including a clamp movable in one direction to an operative position wherein it engages the pallet at the station and firmly clamps it in said precise location and movable in the opposite direction to retract the clamp and disengage the pallet, the combination comprising at least one actuating bar entending lengthwise along said stations and mounted for axial reciprocation, means for shifting said bar axially in opposite directions, a drive member at each said station, said drive member being movable with said bar and also lengthwise of the bar, said drive member being operatively connected with said locating pin and clamp such that the pin and clamp are moved to their operative positions when the drive member is moved in one direction and are moved to their retracted positions when the drive member is moved in the opposite direction, compression spring means acting between said bar and said drive member and biasing said drive member in a direction tending to retract said pin and clamp, means limiting movement of the drive member relative to the bar in said retracting direction whereby when the bar is initially moved in said one direction the locating pin is projected into engagement with the pallet to locate the same and the clamp is brought into clamping engagement with the pallet, and upon further movement of the bar in said one direction said spring means are compressed and cause the drive member to urge said clamp against the pallet with a force proportional to the energy stored in the compressed spring means.

3,968,870

SPIN CYCLE MECHANISM FOR GLASS ARTICLE FORMING MACHINE

John D. Banyas, Toledo, and Edward A. Ross, Waterville, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 419,535, Nov. 28, 1973, Pat. No. 3,902,727, which is a division of Ser. No. 244,700, Aug. 30, 1972, Pat. No. 3,868,010, which is a division of Ser. No. 77,425, Oct. 2, 1970, Pat. No. 3,726,659. This application Sept. 27, 1974, Ser. No. 510,119
Int. Cl.² B65G *47/24*
U.S. Cl. 198—240 **6 Claims**



1. In an article handling apparatus having a plurality of article supporting chucks, a frame, and drive means for driving said chucks in succession upon said frame along a fixed path, each of said chucks having a chuck sprocket thereon mounted for rotation about an axis normal to said path for rotating an article supported in the chuck; a spin cycle mechanism for driving said chuck sprockets in rotation as the chucks are driven along a selected portion of said fixed path comprising a sprocket chain, first support means supporting a first portion of said chain alongside and parallel to said selected portion of said path to meshingly engage and rotate chuck sprockets as the chucks are driven along said selected portion of said path, second support means mounted adjacent said path at a location spaced upstream of the direction of movement of said chucks along said path from said first portion of said chain, a second portion of said chain supported by and extending from said second support means and connected to said first portion of said chain at the upstream end of said first support means, said second portion of said chain being located clear of the path of movement of said chuck sprockets at said second support means and converging with the path of said sprockets in its extent toward said first support means to define a convergent initial sprocket engaging section of said chain, first tension applying means for applying a first tension to said first portion of said chain, and independent second tension applying means for applying a second tension to said second portion of said chain.

3,968,871

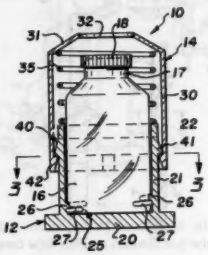
SAFETY CONTAINER FOR MEDICINE BOTTLES AND THE LIKE

Woodrow H. Briscoe, General Delivery, Cowichan Bay, British Columbia, Canada (VoR 1N0)

Filed May 16, 1975, Ser. No. 578,145
Int. Cl.² A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **6 Claims**

1. A container comprising a member insertable over an upper portion of a medicine bottle fitted with a cap, said member having an upper wall provided with an opening through which the cap can pass, spring means biasing the member away from the upper portion of the bottle, and stop

means limiting movement of the member relative to the bottle in response to pressure applied by the spring means normally



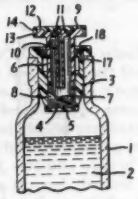
to maintain the cap a predetermined distance from the opening in the upper wall.

3,968,872

DEVICE, PROVIDED WITH A PUNCHER AND A DRIPPER, FOR THE HERMETIC SEALING OF CONTAINERS

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau, Italy

Filed Aug. 2, 1974, Ser. No. 494,375
Claims priority, application Italy, Aug. 3, 1973, 51818/73
Int. Cl.² B65D *25/08*; B67B *7/26*
U.S. Cl. 206—222 **2 Claims**



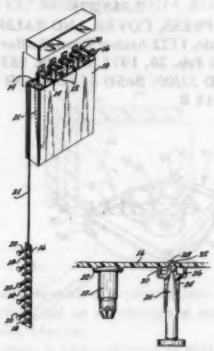
1. A dispensing closure for necked containers comprising a cup-shaped plug insertable and sealable into the neck of a necked container for closing it for containing therein a material to be introduced into the container for mixing with the contents of the container, said cup-shaped plug having a punchable and pierceable bottom, a dispensing element comprising a tubular punching piston inserted in use fluid-tightly axially into said cup-shaped plug and having an inner leading edge at an open inner end adjacent the bottom of the plug bottom for punching and piercing the bottom, said piston being depressable to effect punching and piercing of said bottom for introducing the material contained in the cup-shaped plug into the container, a dispensing tube of lesser diameter than said tubular punching piston fixed in the tubular punching piston extending axially therein and having open ends for dispensing mixture contents of said container after depressing of said tubular punching piston and upon inverting of said container, a removable cover mounted in use on said tubular punching piston closing the outer open end of said dispensing tube, and said cover and said plug having surfaces disposed relative to each other for engaging and removing said cover when said tubular punching piston is depressed.

3,968,873

PACKAGING FOR POWER LOADS AND FASTENERS

Raymond V. Pomeroy, Portland, and Lewis A. Scott, Lake Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Filed Aug. 13, 1975, Ser. No. 604,135
Int. Cl.² B65D *79/00*, *73/02*; F42B *39/08*
U.S. Cl. 206—223 **5 Claims**



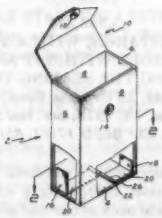
1. A packaging for power loads and fasteners for use in a power actuated tool comprising; a semi-rigid strip, first releasible attaching means for attaching power loads along the strip and second releasible attaching means for attaching fasteners along the strip, said first attaching means attaching to the head of the power load to enable the power load to be inserted into the receiving chamber of the power actuated tool and thereafter the strip peeled away from the power load, and said second attaching means attaching to the point of the fastener to enable the fastener to be inserted into the muzzle of the tool and thereafter the strip peeled away from the fastener.

3,968,874

CONVERTIBLE CIGARETTE CASE

Donald W. Corey, Wilbraham, Mass., assignor to Buxton, Incorporated, Agawam, Mass.

Filed Feb. 20, 1975, Ser. No. 551,375
Int. Cl.² B65D *85/10*, *5/50*; A24F *15/00*
U.S. Cl. 206—248 **7 Claims**



1. In a convertible cigarette case having a bottom and upright front, back and side walls extending from said bottom to a height adapted to accommodate three different lengths of cigarette packages, support means for the shortest and intermediate cigarette packages comprising two pivotable support members each having a lever arm portion disposed at a first position against the bottom of said case and provided with a stand off link extending at a dihedral angle from the lever arm thereof and disposed generally parallel to and closely adjacent

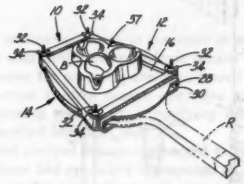
an upright side wall of the case when the lever arm is against the bottom thereof in said first position for receiving the longest of said three different lengths of cigarette packages, said support members being selectively pivotable on an axis parallel to said side walls in opposite directions through obtuse angles from the bottom of said case to cigarette package supporting positions for said shortest and intermediate packages.

3,968,875

RACKET PRESS, COVER AND BALL HOLDER

Ronald L. Koehnle, 1122 Archer Road, Bedford, Ohio 44146

Filed Feb. 26, 1975, Ser. No. 553,238
Int. Cl.² A65D *55/00*; B65D *85/00*; A63B *49/16*, *49/18*
U.S. Cl. 206—315 B **6 Claims**



1. A combination racket press, cover, and ball holder comprising,

a pair of mating members formed of a relatively rigid nondeformable material, said members each having a racket covering portion and a trapezoidal portion formed integrally therewith, said trapezoidal portion being formed of ribs raised from the cover, said racket covering portions being configured to substantially conform in shape with and to overlie and enclose the head of a racket and the trapezoidal portions being disposed to engage the frame of the racket head when the members are disposed together on the head of the racket, clamping means disposed to draw said members toward each other and cause said trapezoidal portions to exert force against the racket frame, ball holding means formed on the outside surface of one of said members, said ball holding means including an upstanding flange portion, a top surface defining an upper rim, said upper rim having inner edge means defining a tennis ball receiving opening, and an interior portion extending downwardly from said inner edge defining a ball receiving pocket.

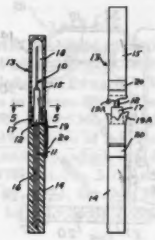
3,968,876

SEALED CONTAINER WITH A STERILIZED HYPODERMIC NEEDLE WITHIN IT AND METHOD FOR EFFECTING THE SEALING THEREOF

Richard A. Brookfield, 25 Drumlin Road, Newton, Mass.

Filed Mar. 19, 1975, Ser. No. 559,830
Int. Cl.² B65D *17/04*, *85/00*
U.S. Cl. 206—365 **5 Claims**

1. A sealed container with a sterilized hypodermic needle within it, said container comprising a receiver section provided with a cylindrical neck at one end and having a chamber opening through the neck and a cap section having a chamber receiving the neck within it, the mouth of the cap portion and the neck being of a fit permitting the sections to be turned relative to each other but dimensioned to establish a friction fit such as to provide a hermetic seal, said container portions including external, flat-surfaced portions that are substantially co-planar, and a seal in the form of a strip overlying said flat-surfaced portions and extending across the junction between the container sections, the container and the sealing strip being of heat sealable material, and heat seals, one between each flat-surfaced portions and said strip, said sealing strip also being of a material that will stretch somewhat and be deformed before rupturing, the seal stretching and rupturing



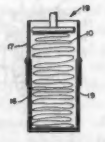
as one container section is turned relative to the other as the sections are pulled apart with the proximate ends of the ruptured seal permanently deformed.

3,968,877

HIGH DENSITY TOW CARTONS

West Carl Mattis, Camden, S.C., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 64,438, Aug. 17, 1970, abandoned. This application June 8, 1971, Ser. No. 151,080
Int. Cl.² B65D *85/671*; B65H *54/84*
U.S. Cl. 206—388 **2 Claims**



1. A package for the shipment and storage of acrylic tow comprising a closed, free-standing, nonbulging, flat-sided, paperboard container substantially filled with a self-supporting block consisting essentially of a tow of acrylic fibers having a shrinkage of not more than 3% and a moisture content of not more than 2% by weight, said block having a density between about 25 and 33 lbs/ft³, and said tow being readily withdrawable from said block for textile processing.

3,968,878

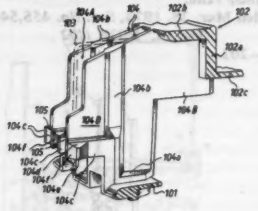
CIRCULAR MAGAZINE FOR PHOTOGRAPHIC TRANSPARENCIES

Alfred Winkler, Munich; Albert Eggering, Leverkusen; Volkmar Stenzenberger, and Herbert Wilsch, both of Unterhaching, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Jan. 17, 1974, Ser. No. 434,293
Claims priority, application Germany, Jan. 20, 1973, 2302881; Sept. 15, 1973, 2346596
Int. Cl.² G03B *23/06*
U.S. Cl. 206—455 **40 Claims**

1. A round tray for photographic transparencies, comprising an annulus of equidistant radially extending partitions defining radially extending compartments for transparencies,

each of said partitions having at least one elastically deformable part integral therewith arranged to engage and yieldably



hold said transparencies in at least one of the neighboring compartments; and wall means connected with said partitions.

3,968,879

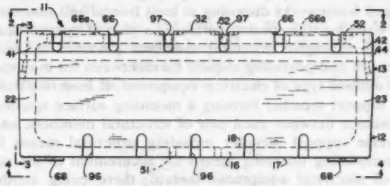
SHIPPING CONTAINER AND ASSEMBLY THEREOF

George Anthony Lucas, Sr.; George Anthony Lucas, Jr., both of Delano; Louis Anthony Lucas, Santa Maria, and Joseph Slapnik, Arcadia, all of Calif., assignors to George A. Lucas & Sons, Earlimart, Calif.

Filed Nov. 12, 1973, Ser. No. 414,765

Int. Cl.[2] B65D *21/02, 11/10, 11/20*

U.S. Cl. 206—509 **8 Claims**



1. A shipping container of the type which can be stacked comprising a bottom part and a top part formed of a plastic foam material, said bottom part having a bottom wall, spaced generally parallel side walls and spaced generally parallel end walls, said side walls of said bottom part having vertical outer surfaces with tapered surfaces extending inwardly adjacent the lower portions thereof, said side walls of said bottom part having openings extending through the side walls of the bottom part and the tapered surfaces of the side walls of the bottom part, said tapered surfaces on the side walls of the bottom part having a height so that the openings in the bottom part extend solely through the tapered surfaces of the side walls of the bottom part, said top part having a top having a top wall, spaced generally parallel side walls and spaced generally parallel end walls, said side walls of said top part having vertical outer surfaces with tapered surfaces extending inwardly adjacent the upper portions thereof, said side walls of said top part having openings extending through the side walls of the top part and the tapered surfaces of the side walls of the top part, said tapered surfaces on the side walls of the top part having a height so that the openings in the top part extend solely through the tapered surfaces of the side walls of the top part, cooperative mating means carried by the bottom and top parts whereby the top part is releasably secured to the bottom part to form an enclosed volume within the bottom and top parts which is ventilated by the openings in bottom and top parts, cooperative stacking means carried by the bottom and top parts adapted to mate with containers of the same type so that the containers may be stacked with the top part of one container engaging the bottom part of another container and inhibiting substantial lateral and longtitudinal movement of the containers with respect to each other so that the containers are interlocked when stacked one on top of the other or when they are cross stacked, said cooperative stacking means including a plurality of spaced parallel rows of recesses in the outer surface of one of the parts, and protrusions formed on the outer surface of the other of the parts and having a shape so that they are adapted to fit within said recesses.

3,968,880

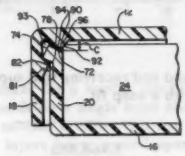
PLASTIC CONTAINER

Efrem M. Ostrowsky, Highland Park, Ill., assignor to VCA Corporation, Baton Rouge, La.

Filed Aug. 28, 1975, Ser. No. 608,545

Int. Cl.[2] B65D *43/04, 43/14, 85/56*

U.S. Cl. 206—540 **15 Claims**



1. In an integrally formed, one-piece plastic container having a bottom section and an overlying top section hinged to said bottom section wherein:

said bottom section is characterized in that it has a planar bottom wall, two opposed, upturned sidewalls, an upturned back wall, and an upturned front wall, all of which are integrally formed and connected to each other; and

said top section is characterized in that it has a planar top wall, two opposed, downturned sidewalls, a downturned front wall, all of which are integrally formed and connected to each other and a downturned back wall integrally formed and connected to said top wall;

the improvement which comprises: said upturned front wall having an outwardly and upwardly projecting latching lug, said latching lug having an upper and lower surface which diverge one from the other; and said downturned front wall having on its inside surface an inwardly projecting lower latching protuberance and said top wall having on its inside surface a downwardly projecting upper latching protuberance, at least a part of said lower latching protuberance and said upper latching protuberance being in close proximity to said lower surface and said upper surface respectively, so that the distance between said parts is less than the distance between said surfaces at their distal ends.

3,968,881

MULTIPLE STACKING LETTER TRAY

Valentin E. Beil, Eden, and Francis J. Ihlenfeld, West Seneca, both of N.Y., assignors to McDonald Products Corporation, Buffalo, N.Y.

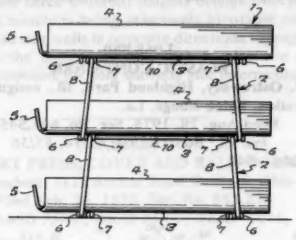
Filed Sept. 30, 1974, Ser. No. 510,795

Int. Cl.[2] A47F *3/14;* **B42F** *17/00*

U.S. Cl. 211—128 **8 Claims**

1. A multiple stacking letter tray comprising a first tray member, a second tray member, and means including a tray support member supporting said second tray member in vertically spaced relation above said first tray member, said tray support member having leg portions extending between said tray members in downwardly diverging relation and terminating at their lower ends in horizontal foot portions extending therefrom into connected engagement with the underside of said first tray member, and a generally U-shaped horizontal upper end portion extending between the upper ends of said leg portions and connected to the underside of said second tray member in supporting relation thereto and each of said tray members having a pair of laterally spaced footpads on the underside thereof for respectively engaging said foot portions

of said lower ends and said U-shaped upper end portion of said tray support member, all of said footpads having spring fingers



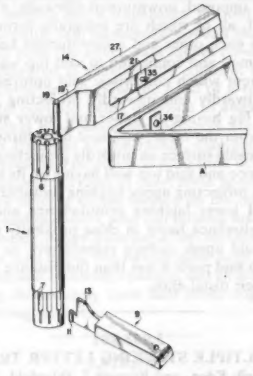
for engaging around and receiving said support member horizontal portions with a snap fit.

3,968,882

COMPLETE SET OF ELEMENTS FITTING IN UNIT-COMPOSED SUPPORTING SYSTEMS

Fabio Mello, Milan, Italy, assignor to Commerciale Sacea, S.a.s., Milan, Italy

Filed Nov. 12, 1973, Ser. No. 414,665
Claims priority, application Italy, Nov. 14, 1972, 31624/72; Oct. 31, 1973, 30764/73
Int. Cl.² A47F *5/00*
U.S. Cl. 211—189 10 Claims



7. A combination for office furniture comprising

a vertically disposed rod having an axial passage passing therethrough for receiving at least one wire, a plurality of radially directed slots at an upper end, at least some of said slots being shaped in a shape of a cylinder and a rectangular parallelepipedon, and a plurality of radially directed slots at a lower end, each of said latter slots having a widening at an upper end thereof;

a horizontally disposed bar having at least one inner passage for receiving at least one wire;

a terminal element secured to an end of said bar and having a parallelepipedon element and a cylindrical element fitted in a respective one of said shaped slots at said upper end of said rod for securing said bar to said rod; and

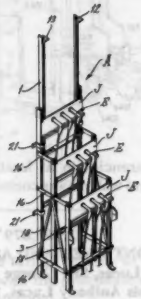
a base having a terminal element engaged within one of said slots at said lower end and sized for withdrawal through the widening of said one slot.

3,968,883

COLLAPSIBLE JUNCTION SUPPORT BRACKET

Marion R. Farmer, Memphis, Tenn., assignor to Aluma-Form Inc., Memphis, Tenn.

Filed Mar. 28, 1974, Ser. No. 455,540
Int. Cl.² H02B *1/02*
U.S. Cl. 211—201 6 Claims



1. In a junction support bracket of the type designed for supporting electrical elbows, connectors, terminators, and related electrical equipment comprising a series of vertically arranged frameworks disposing at least frontal and rear electrical equipment mounting surfaces, a pair of spaced apart vertically arranged structural members provided in each framework and providing a space therebetween for mounting of the defined type of electrical equipment, at least one transverse support member forming a mounting surface spanning the distance between each pair of structural members, each transverse support member including structural means for accommodating fastening means for securement of the said type of electrical equipment thereto, there being another space formed between each adjacent frameworks when the bracket is erected, said space being of a dimension to accommodate the convenient arrangement of electric lines therethrough for connection with the aforesaid type of electrical equipment, each forwardmost mounting surface being arranged lower than the mounting surface of the framework therebehind, a series of stringers interconnecting the frameworks together, and said series of frameworks being collapsible towards each other to compact the bracket and facilitate its shipment.

3,968,884

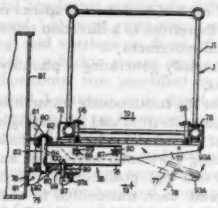
STORAGE MEANS FOR JIB FOR TELESCOPIC BOOM OF MOBILE CRANE

James N. Johnson; James C. Mayo, Sr., both of Cedar Rapids, Iowa., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Dec. 20, 1974, Ser. No. 534,746
Int. Cl.² B66C *23/06*
U.S. Cl. 212—55 8 Claims

1. In a mobile crane: a boom swingable upwardly and downwardly in a vertical plane; a jib having a base and selectively and pivotably connectable to the point end of said boom, said jib being swingable in a horizontal plane to and from a jib storage position alonside said boom; jib storage means on said crane to facilitate storage of said jib in a generally horizontal plane alongside said boom, said jib storage means comprising at least one jib storage assembly disposed adjacent said boom, said jib storage assembly comprising: a first support member, means pivotally mounting said first support member for pivotal movement in a direction outwardly of said boom; and a second jib support member pivotally connected to said first support member and pivotable about a horizontal axis which is generally parallel to said vertical plane by said jib between

a horizontal jib storage position wherein the jib can rest thereon and a downwardly tilted jib loading and unloading



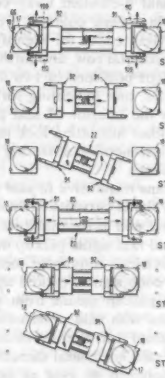
position such that as said jib is slid horizontally off of or onto said second jib support member the latter is pivoted in response to the sliding movement of the jib.

3,968,885

METHOD AND APPARATUS FOR HANDLING WORKPIECES

Javathu K. Hassan, Hopewell Junction; Alfred Mack, and Michael R. Wojtaszek, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 375,279, June 29, 1973, Pat. No. 3,874,525. This application Aug. 27, 1974, Ser. No. 501,005
Int. Cl.² B25J *3/00*
U.S. Cl. 214—1 BC **14 Claims**



1. An apparatus for transferring workpieces between first and second stations including:

a rotary arm;

said arm having workpiece gripping means disposed 180° from each other;

index means to rotate said arm 180° in a plane during each activation to always position each of said gripping means at one of the stations; and

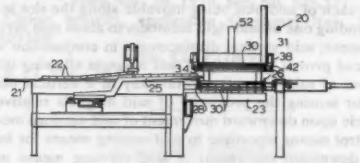
each of said gripping means having means responsive to the station at which it is located to cause one of said gripping means to grasp one of the workpieces at only the first station and to release the grasped workpiece at only the second station and to cause the other of said gripping means to grasp one of the workpieces at only the second station and to release the grasped workpiece at only the first station.

3,968,886

STICKER EMPLACER FOR A LUMBER STACKER

Edward M. Leon, Fort Bragg, Calif., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 29, 1975, Ser. No. 544,955
Int. Cl.² B65G *57/26*
U.S. Cl. 214—6 M **14 Claims**



1. A sticker emplacer for a lumber stacker of the type in which individual boards on a single layer are grouped into a series of layers of several boards each and said layers are stacked, successive layers being spaced apart by a series of spaced-apart stickers running laterally across each layer of boards, said stacker being provided with a series of stacked stickers providing a bottom end, said emplacer including in combination:

sticker transfer means for moving the bottom sticker of each stack of stickers laterally transverse to its longitudinal axis,

sticker holder means for receiving each said bottom sticker from said sticker transfer means and holding it positively,

holder lowering means for positively lowering each said sticker holder means with its sticker until the sticker contacts the top of a layer of boards, and

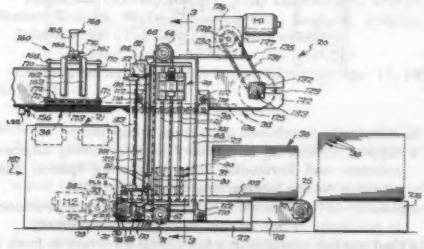
release means for releasing said sticker holder means from said sticker following contact of the sticker with the layer of boards and for releasing said holder lowering means, so that said sticker holder means is retracted upwardly after releasing said sticker.

3,968,887

ARTICLE PICK-UP AND TRANSFER APPARATUS

Anthony F. Madonia, 19 Middlebury Lane, Buffalo, N.Y. 14216

Filed Sept. 18, 1972, Ser. No. 290,269
Int. Cl.² B65G *59/04*
U.S. Cl. 214—8.5 D **8 Claims**



1. An article transfer apparatus comprising: an upright frame, means for supporting a stack of articles adjacent the lower end of said frame, a plurality of upright support rods rigidly secured to said frame, carriage means vertically slidable on said rods and disposed in vertical registry with said article supporting means, means for moving said carriage means toward and away from said article supporting means, said carriage means including support plates, a plurality of elongated rigid members suspended from said support plates, at least one permanent magnet mounted on the lower end of each of said rigid members, each magnet being pivotally mounted at spaced locations thereon to two of said rigid

members, means mounting said rigid members on said plates for pivotal movement and bodily vertical displacement relative to said support plates whereby said magnets are self-orienting upon engagement thereof with an irregularly shaped article on said stack, said rigid member mounting means comprising pins projecting outwardly from said support plates, each of said rigid members having an elongated slot for receiving a corresponding one of said pins and being suspended thereby, each of said pins being movable along the slot in the corresponding one of said rigid members to allow said vertical displacement, said vertical displacement in conjunction with said spaced pivotal mounting of said magnets allowing tilting movement of said magnets substantially in a vertical plane, means for sensing the proximity of said magnets relative to said article upon downward movement of said carriage means, and control means reponsive to said sensing means for interrupting downward movement of said carriage means upon engagement of said magnetic means with said article and initiating upward movement of said carriage means to lift said magnets and remove a single article from said stack.

3,968,888

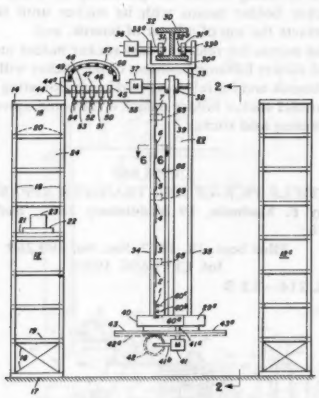
WAREHOUSE SYSEM WITH PARALLEL CONDUCTOR POSITIONAL CONTROL MEANS FOR A STACKER CRANE

William George Van Vliet, Greenwich, Conn., assignor to The Lummus Company, Bloomfield, N.J.

Filed Oct. 21, 1968, Ser. No. 769,012

Int. Cl.[2] B65G 1/06

U.S. Cl. 214—16.4 A **6 Claims**



1. Automatic warehouse apparatus, comprising:

a support containing a plurality of intersecting adjacent columns and horizontal rows of storing spaces, each common to one intersecting column and row;

a plurality of first electric conductor means, each positioned in proximity of one of said storing space columns;

a load stacker movable in a horizontal direction in front of each of said first conductors and corresponding storing space columns;

first signal pickup means mounted on said stacker to slidably engage, portions of each said first electrode conductor means in turn;

a plurality of second electric conductor means mounted on said stacker, each positioned in relation to one of said storing space horizontal rows;

a carriage mounted on said stacker and movable in a vertical direction thereon in front of each of said second conductors and corresponding storing space horizontal row;

second signal pickup means mounted on said carriage to slidably engage each of said second conductors in turn;

computer means mounted on said stacker;

a load handling fork movable on said carriage to extend into the interior of each of said storing spaces one at a time and to retract therefrom in a direction transverse to said carriage vertical movement;

means for continuously generating a plurality of different carrier currents;

first circuit means for continuously transmitting certain of said different currents from said generating means to said plurality of first electrical conductor means including one current indicating horizontal movement and other currents arranged in 1 digit positions of different 4-element Gray code signals, each transmitted to one of said first electrical conductor means for identifying the corresponding storing space column;

second circuit means for continuously transmitting additional of said different currents from said generating means to said second electrical conductor means including one current indicating vertical movement and other currents arranged in 1 digit positions of different 3-element Gray code signals, each transmitted to one of said second electrical conductor means for identifying the corresponding storing space horizontal row;

means for preselecting a predetermined load action of said fork at a preselected storing space formed by preselecting one intersecting storing space column and horizontal row; said preselecting means actuating said generating means to transmit therefrom on said second circuit means to said computer means a carrier current command signal including in sequence a carrier current indicating an outgoing signal, a carrier current indicating horizontal movement, a carrier current indicating vertical movement, a carrier current indicating transverse movement, a preselected one of said 4-element Gray codes identifying a preselected storing space column, a preselected one of said 3-element Gray codes for identifying a preselected storing space horizontal row, and further carrier currents arranged in 1 digit positions of two different 2-element Gray code signals, one indicating fork movement from said carriage to the interior of said preselected storing space and the other indicating fork movement from the interior of said last-mentioned storing space back to said carriage in sequence.

said computer means responsive to said outgoing and horizontal direction signal currents derived from said second circuit means and said horizontal direction signal current picked up by said first signal pickup means engaging one of said first electrical conductor means for comparing said 4-element code signals picked up one at a time by said first signal pickup means from said first electrical conductor means with said preselected 4-element code signal derived from said second circuit means to move said stacker in said horizontal direction in front of said storing space columns so long as said 4-element code signals picked up one at a time by said first pickup means from said first electrical conductor means are different from said last-mentioned preselected 4-element code signal, said computer means stopping said stacker in front of one of said portions of first electrical conductor means and corresponding storing space column identified by said last-mentioned preselected 4-element code signal when said 4-element code signal picked up from said last-mentioned one first electrical conductor means by said first pickup means is identical with said last-mentioned preselected 4-element code signal.

said computer means further responsive to said outgoing and vertical direction signal currents derived from said second circuit means and said vertical direction signal current picked up by said second signal pickup means engaging one of said second electrical conductor means for comparing said 3-element code signals picked up one at a time from said second electrical conductor means

with said preselected 3-element code signal derived from said second circuit means to move said carriage in said vertical direction in front of said storing space horizontal rows so long as said 3-element code signals picked up one at a time by said second pickup means from said second electrical conductor means are different from said last-mentioned 3-element code signal, said computer means stopping said carriage in front of one of said second electrical conductor means and corresponding storing space horizontal row identified by said last-mentioned preselected 3-element code signal when said 3-element code signal picked up from said last-mentioned one second electrical conductor means by said second pickup means is identical with said last-mentioned 3-element code signal; said storing space column and horizontal row at which said stacker and carriage, respectively, are stopped forming said preselected storing space;

said computer means additionally responsive to said outgoing and transverse movement signal currents and one 2-element code signals to extend said fork from said carriage into the interior of said preslected storing space and therafter responsive to said other 2-element code signal to retract said fork from the interior of said last-mentioned storing space back to said carriage in response to said last-mentioned other 2-element code signal, said computer means programmed to actuate said fork in said predetermined load action in a time between said last-mentioned one and other 2-element code signals while said fork is in the interior of said pre-selected storing space;

said first signal pickup means comprising a plurality of pickup shoes horizontally aligned to overlap each of said first electrical conductor means in slidable engagement therewith, said pickup shoes slidably engaging adjacent first portions of said electrical conductor means to pick up said 4-element code signals therefrom, said computer means responsive to said last-mentioned signals for moving said stacker in said horizontal direction in front of said storing space columns, said computer means responsive to said 4-element code signal picked up by said shoes and preselected code signal when said shoes are stopped on said portion of said first electrical conductor means from which said picked up 4-element code signal is identical with said preselected 4-element code signal to stop said stacker in front of said storing space column corresponding with said last-mentioned portion of said one first electrical conductor means; and

said plurality of pickup shoes including at least three horizontally spaced pickup shoes of which a middle shoe engages a middle portion of each portion of said first electrical conductor means and outer shoes overlap opposite ends thereof, said middle shoe and one outer shoe engaging each portion of said first electrical conductor means and the other outer shoe engaging an adjacent portion of said first electrical conductor means to pick up said 4-element code signals from both latter electrical conductor means, said computer means responsive to said 4-element code signals picked up one at a time by said middle shoe from said first electrical conductor means to move said stacker at one rate of speed in the horizontal direction in front of said storing space columns to dispose a preselected point on said stacker approximately opposite to a preselected point on said portion of said first electrical conductor means from which said picked up 4-element code signal is identical with said preselected code signal, said computer means responsive to said preselected 4-element code signal and a 4-element code signal picked up by one of said outer shoes from a first electrical conductor means adjacent to said last-mentioned first electrical conductor means to move said stacker at a rate of speed different from said last-mentioned one speed rate for stopping said stacker preselected point precisely opposite to said last-mentioned first electrical conductor means from which said picked up 4-element code signal is identical with said preselected 4-element code signal.

3,968,889

CONVEYOR FOR TRANSPORTING WORKPIECES

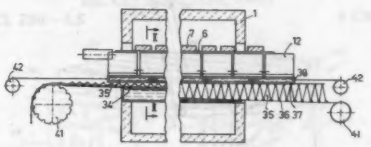
Günter Hepp, Oberhausen, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf-Heerdt, Germany

Filed Nov. 20, 1974, Ser. No. 525,371

Claims priority, application Germany, Nov. 28, 1973, 2359160

Int. Cl.² F27B 9/00

U.S. Cl. 214—18 R **10 Claims**



1. A conveyor for transporting workpieces through heat-exchange zones, comprising at least one supporting structure which includes a pair of transversely spaced and linked conveyor sections together forming a channel having an open side, said conveyor sections each having a workpiece-supporting surface elongated in the direction of transport and together bounding said open side; and means for lifting and lowering the workpieces relative to said workpiece-supporting surfaces of said conveyor sections and for moving the workpieces in said transport direction, including a support beam elongated in said direction of transport and being movably mounted in said channel, workpiece-lifting members mounted for above said beam shifting and lifting movement relative to said channel, a lifting element extending along and beneath said support beam and converging upwardly towards the same in direction of the elongation thereof, and a wedge-shaped raising element having a planar upper face which extends parallel to an underside of said support beam and which raising element is actuated by said lifting element so as to move said workpiece-lifting members through said open side and thereby lift the workpieces off said workpiece-supporting surfaces and transport the workpieces in said direction of transport.

3,968,890

VEHICLE LOAD LIFTING AND LOWERING UNITS

Robert Robson, Welwyn Garden City, England, assignor to John Ratcliff (Tail Lifts) Limited, England

Filed Apr. 8, 1975, Ser. No. 566,113

Claims priority, application United Kingdom, Apr. 11, 1974, 16393/74

Int. Cl.² B60P 1/44

U.S. Cl. 214—75 T **8 Claims**

1. For attachment to a vehicle, a load lifting and lowering unit comprising:

a. a pair of parallel spaced-apart guides, mountable in a vehicle so as to stand substantially upright across an access opening of the vehicle,

b. a pair of articulated parallelogram linkages, slidably supported one on each of said guides,

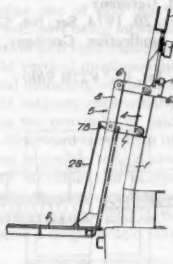
c. a load lifting and lowering platform pivotally carried between said linkages,

d. a prime mover connected to said articulated linkages to move the linkages up and down the guides,

e. means to actuate the articulated linkages, during movement thereof in one direction along a predetermined length of said guides, to alter the configuration of the linkages and thereby move the platform towards the interior of the vehicle for storage purposes, and to actuate the articulated linkages in the opposite sense, during

reverse movement of the linkages along said predetermined length, thereby to move the platform away from said interior towards an operative position, and

f. an inextensible tie member, pivotally connected between said platform and a swinging link of said parallelogram linkage at points which lie on the same side of the platform pivot, so that, when the linkage is actuated to move the platform towards the interior of the vehicle, the platform is swung about its pivot to fold with the linkage towards the vehicle interior, and when the linkage is actuated in the opposite sense the platform is swung in the opposite direction about its pivot to unfold with the linkage into its operative position.

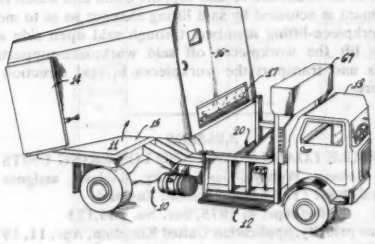


3,968,891

UNITIZED TWO STAGE COMPACTOR APPARATUS FOR REFUSE COLLECTING TRUCKS OR THE LIKE

William V. Perkins, Monrovia, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Filed Jan. 16, 1975, Ser. No. 541,614
Int. Cl.² B65F *3/00*
U.S. Cl. 214—83.3 **9 Claims**



1. A refuse collecting and compacting truck, comprising;

a chassis having a refuse receiving tank thereon, a forward bulkhead of said tank being formed with a refuse receiving opening adjacent the lower end of said bulkhead;

an upwardly open refuse hopper mounted on said chassis forwardly adjacent to said bulkhead, said hopper having a rearwardly facing open end in registration with said opening in said bulkhead;

a primary compactor ram mounted within said hopper for reciprocation between a retracted position in which refuse is receivable within said hopper rearwardly of said ram, and an extended position;

a precompactor panel transversely mounted on said hopper in forwardly spaced relationship relative to said bulkhead for movement between retracted and extended positions,

said panel, when retracted, overlying said retracted ram and extending vertically forwardly and upwardly to define a barrier adapted to gravitationally deflect refuse into said upwardly open hopper and away from said retracted ram,

said panel having an actuating means for moving said panel between retracted and extended positions, said actuating means being so oriented as to be overlain by said panel when said panel is in said retracted position,

said panel being movable rearwardly and downwardly by said actuating means to said extended position to compact refuse, if any, protruding above said hopper downwardly into said hopper and rearwardly towards said opening of said bulkhead,

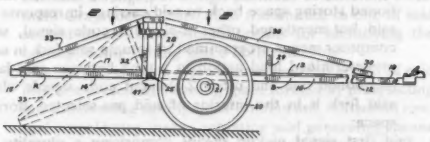
said panel, when fully extended, covering said hopper to define an essentially closed conduit with said hopper for reciprocation of said compacting ram and, also, then serving as a barrier against escape of refuse from said tank and said hopper.

3,968,892

TRAILER

Francis L. Spors, 1426 Nobel St., Fairbanks, Alaska 99701

Filed Aug. 21, 1975, Ser. No. 606,524
Int. Cl.² B60P *1/04*
U.S. Cl. 214—505 **12 Claims**



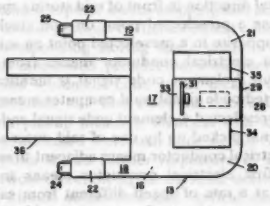
1. Trailer apparatus comprising a longitudinally elongated main frame having a front end portion and a rear end portion, wheel means for supporting the main frame, a loading ramp having a front end portion and a rear end portion, means hingedly connecting the ramp to the main frame rear end portion for movement between a downwardly and rearwardly inclined loading position, and a transport position to extend rearwardly of the main frame in the same general direction as the main frame, first side frame means mounted on the main frame to extend a substantial distance thereabove adjacent the main frame rear portion, second side frame means mounted on the ramp to extend a substantial distance thereabove adjacent the ramp front end portion, and latch mechanism for latchingly connecting the first and second side frame means together at a substantially higher elevation than the main frame rear portion.

3,968,893

MATERIAL HANDLING VEHICLE WITH H-SHAPED WALK AREA

Sidney D. Lapham, Walnut Creek, Calif., assignor to Lapham Engineering Co., Inc., Martinez, Calif.

Division of Ser. No. 266,219, June 26, 1972, Pat. No. 3,825,130. This application June 24, 1974, Ser. No. 482,315
Int. Cl.² B65G *47/00*
U.S. Cl. 214—700 **12 Claims**



1. A motor-driven vehicle for handling materials comprising:

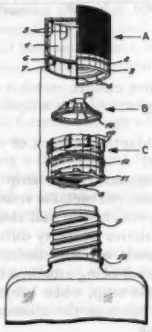
a. a plurality of wheels mounted on said vehicle;
b. steering means operatively engaging at least one of said wheels for turning said wheels for steering said vehicle along a supporting surface;
c. a battery-driven motor disposed at the forward end of said vehicle and operatively engaging at least one of said wheels for rotating said latter wheel and thus moving said vehicle along said supporting surface;
d. at least a pair of batteries disposed on opposite sides of said motor at the forward end of said vehicle and operatively engaging said motor for supplying electrical power thereto;
e. a generally H-shaped horizontal walkway on said vehicle extending both across the short axis of said vehicle generally at the midpoint thereof and from the rear end of said vehicle, about both sides of said batteries opposite the sides of said batteries adjacent said motor and terminating at the forward end of said vehicle with at least a portion thereof in front of said motor whereby an operator may walk almost completely about the periphery of the upper surface of said vehicle and across said vehicle, said motor and said batteries occupying the area between the forward end of said generally H-shaped walkway and a cutout area being disposed between the rear end of said generally H-shaped walkway; and
f. fork lift means carried by said vehicle disposed below said walkway and operatively connected to said motor for engaging a pallet and lifting said pallet with respect to said vehicle, said fork lift means including a fork having a pair of spaced fork tines extending outwardly past the rear of said vehicle and within the cutout area of said walkway.

3,968,894

SAFETY CLOSURE CAP

Ernst Herrmann, Kunststoff-Spritwerk Nord 27, 9428 Walzenhausen, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,727
Claims priority, application Switzerland, Oct. 2, 1974, 13264/74
Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—220 **7 Claims**



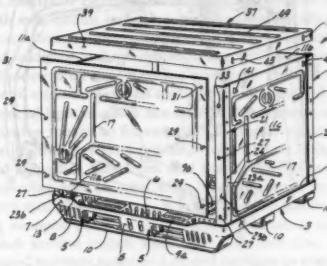
1. A safety closure cap characterised by the fact that it comprises a cup and an internal part, which is retained within said cup but submitted to a resilient action tending to displace it toward the outside of said cup; corresponding ratching formations on the internal wall of the cup and on the outside wall of the internal part, cooperating to drive the internal part in rotation with the cup in only one direction of rotation, whatever the axial position of the internal part is with respect to the cup; and by the fact that corresponding driving formations provided on the internal surface of the cup and on the outside surface of the internal part, cooperate in order to drive the internal part through the cup in the other direction of rotation only when the internal part is axially displaced with respect to the cup against the resilient action.

3,968,895

AIR CARGO SHIPPING CONTAINER

Richard R. Barnes, Jr., Bridgeton; Douglas E. MacArthur, Chesterfield; William Roy Wodell, St. Louis, and Irving Herbert Bernard, Bridgeton, all of Mo., assignors to Richard R. Barnes, Jr., Bridgeton and Douglas E. MacArthur, Chesterfield, both of, Mo.

Filed Feb. 19, 1975, Ser. No. 551,022
Int. Cl.² B65D *7/24, 19/02*
U.S. Cl. 220—1.5 **3 Claims**



1. An air cargo shipping container comprising a rectangular base of molded synthetic resin material which is generally chemically inert to most substances, said base having a plurality of legs formed in its bottom for supporting the base above the ground, said legs being spaced for entry of the lifting tines of a forklift or the like, each said leg being hollow and open at its upper end thus defining a plurality of reservoirs on the inside of the base for containing spilled cargo, and an integral lip around the periphery of said base and extending above the level thereof, said container further having three panels constituting foldable panels hingedly secured to said lip for swinging between a generally vertical, erect position and a generally horizontal, folded position in which said panels overlie the base, and a fourth panel, constituting a front panel, being readily removable from said base and from said adjacent panel so as to enable loading and unloading of the container, and a lid engageable with the upper edges of said panels to close the container, two of said foldable panels being hingedly secured to said base on opposite ends of said front panel and thus constituting side panels, and the other said foldable panel being hingedly secured to said base opposite said front panel and constituting a back panel, said side panels each having a pair of angle members secured to their vertical edge portions, said angle members each having a pair of intersecting leg portions, one leg portion of each angle member being disposed on the outside of the vertical edge portion of the corresponding front or back panel to which the vertical edge portions of each side panel is interconnected, said container further having means for releasably securing said front panel to said side panels comprising at least one aperture in each said vertical edge portion of said front panel and at least one aperture in each said angle member leg portion disposed on the outside of said front panel, said leg portion apertures being below said panel apertures, a fastening member secured to said front panel vertical edge portion and projecting outwardly therefrom and received in a respective leg portion aperture, another fastening member secured to and projecting inwardly from the inner face of each said leg portion and received in a respective panel aperture, and removable securement members engaging said fastening members for holding said panels and said leg portions in assembled relation, said front panel when removed from said base being stowable on the base and said lid being cooperable with said base to enclose said foldable and said front panels therebetween so as to

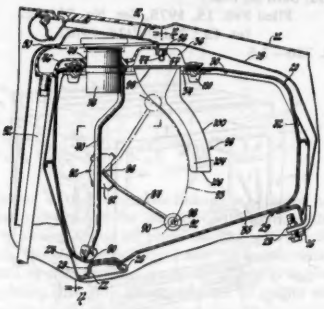
permit shipment of empty containers in a knock-down configuration.

3,968,896

FUEL TANK

John B. Giacoletti, Utica; Thomas C. Ryding, Madison Heights, and Walter C. Zetye, Orchard Lake, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 20, 1975, Ser. No. 588,887
Int. Cl.[2] B65D *25/14, 25/02*
U.S. Cl. 220—63 R 4 Claims



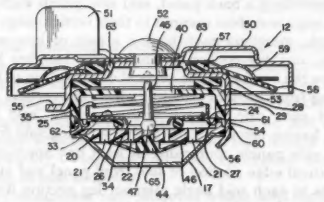
1. A fuel tank comprising an enclosure having a flexible wall and a rigid wall and adapted to contain liquid fuel, a fuel level sensor disposed within said enclosure and including a pivotally mounted arm having an end free for movement along an arcuate path in a selected plane and further including a float secured to said free end and responsive to the level of fuel within said enclosure for positioning said end of said arm along said path, means responsive to the position of said end of said arm for indicating the fuel level in said enclosure, and a fender having a flange secured to said rigid wall and a contoured portion disposed in said plane adjacent said arcuate path to prevent interference between said flexible wall and said arm should said flexible wall collapse.

3,968,897

PRESSURE-VACUUM RELIEF VALVE ASSEMBLY

Robert E. Rodgers, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 485,350, July 3, 1974, Pat. No. 3,929,158. This application Oct. 30, 1974, Ser. No. 519,350
Int. Cl.[2] F16K *17/18*
U.S. Cl. 220—204 6 Claims



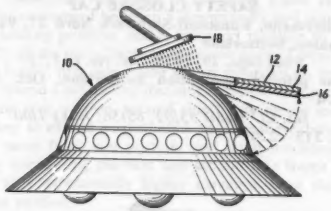
1. A safety pressure-vacuum relief cap for closing the filler neck of vehicle fuel tanks and the like comprising a fitting having a upper end and a lower end and having an upwardly facing substantially flat flange circumscribing its upper end and disposed in a plane substantially perpendicular to the axis of said fitting, a generally circular plate resting on and peripherally substantially congruent with said flange, said plate having a plurality of openings axially therethrough, each of said openings being disposed at at least a first radial distance from the center of said plate, said plate also having at least one aperture extending axially therethrough at a radial distance from said plate center less than said first distance, an inverted cap having a peripheral skirt, defining an annular shoulder, defining an annular, flexible gasket having an outer peripheral bead gripped between said plate and said shoulder and an inner peripheral bead engaging the upper flat surface of said plate in an annular area disposed between said first distance and said lesser distance, an outer shell for said cup providing means for engaging the filler neck and providing means for holding said fitting and said cup against axial separation, a seal plate having a central aperture and bearing on a radially inward region of the upper surface of said gasket, spring means confined between the floor of said cup base and said seal plate to urge said gasket inner peripheral bead into yieldable sealing contact with the upper surface of said plate to provide a pressure valve for the tank, a rubberoid umbrella valve having a stem centrally penetrating and axially fixed relative to said plate and having its flexible outer peripheral region normally in sealing engagement with the lower surface of said plate in an annular region disposed between said first distance and said lesser distance to provide a vacuum valve for the tank, and said lower end of said fitting being ported to provide communication with the interior of a fuel tank for such a vehicle, and said cup and said outer shell being ported to provide communication with the atmosphere.

3,968,898

MAGNETOSTRICTIVE CLOSURE MEMBER

Andrew E. Beer, 25 Sutton Place, New York, N.Y. 10022

Filed Aug. 26, 1974, Ser. No. 500,334
Int. Cl.[2] B65D *41/02, 43/14*
U.S. Cl. 220—260 6 Claims



1. A magnetostrictive closure member comprising:
a. a housing having an opening adapted to receive closure means;
b. closure means adapted to open or close the opening in said housing; and
c. a bimetallic magnetostrictive strip adapted to operate said closure means, one metallic component of said bimetallic strip being attached to said closure means and having a magnetostrictive property different from the other metallic component of said bimetallic strip, said other metallic component being attached to said housing, such that the bimetallic strip, when subjected to a change of magnetic field, operates the closure means to open or close the opening.

3,968,899

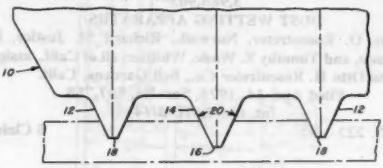
EASY-OPEN CONTAINER WALL AND APPARATUS

Charles L. Jordan, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 451,191, March 14, 1974. This application June 20, 1975, Ser. No. 588,633
Int. Cl.[2] B21D *51/38*
U.S. Cl. 220—266 9 Claims

5. A metallic container wall comprising

a removable sector having an integral opening device;
a primary score line defining said removable sector; and
a secondary score line substantially coextensive with said primary score line having a depth of no more than about 75% of that of said primary score line and located between said primary score line and the periphery of said removable panel with its centerline no more than about 0.040 inch from the centerline of said primary score line whereby said primary score line may be deep and narrow and yet have dependable integrity.

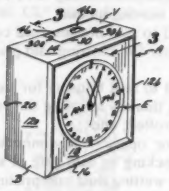


3,968,900

TIMED MEDICANT DISPENSING DEVICE

Berigoj K. Stambuk, 655 Camino De Los Mares, Suite 119, San Clemente, Calif. 92672

Filed July 25, 1975, Ser. No. 599,169
Int. Cl.² G04C 23/18
U.S. Cl. 221—3 7 Claims



1. A device for storing a plurality of hollow balls defined by interlocking half portions that may be manually separated, which balls are consecutively dispensed at desired time intervals, with each of said balls serving as a carrier for a prescribed quantity of a medicant contained therein, which device includes:

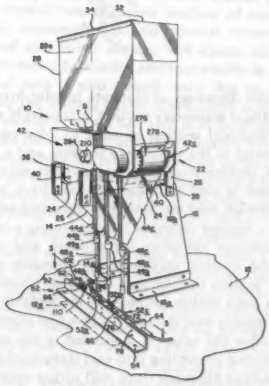
a. a cannister in which said balls are stored, in which cannister an opening is formed through which said balls can roll by force of gravity;
b. a housing having a first opening formed therein through which said cannister may be inserted into the interior thereof, and with a second opening being formed in said housing through which said balls may roll due to force of gravity;
c. a spring-loaded ball dispenser tray pivotally supported from said housing that in a first position obstructs said second opening and when in a second position serves as a support for a ball discharged thereonto from said second opening;
d. movable ball stop means in said housing capable of occupying first and second positions, with said ball stop means as it moves from said first to said second position allowing one of said balls to roll from said cannister and pivot said dispenser tray from said first to said second position;
e. first electrically operated spring-loaded means for moving said ball stop means from said first to said second position;
f. an electrically operated timer supported at a fixed on said housing, said timer including a drive shaft;
g. an opaque, non-light reflecting disk having a plurality of circumferentially spaced apertures formed therein, with said disk being non-rotatably mounted on said drive shaft;
h. electrically operated light generating means which emit a beam of light that is sequentially aligned with said apertures as said disk rotates;
i. light sensitive means that becomes electrically conductive only when said beam of light travels through one of said apertures and impinges thereon;
j. a source of electric power;
k. electrically operated sound generating means;
l. a first normally open electrical switch that is closed when said dispenser tray pivots to said second position;
m. a second normally closed electric switch that is opened when said dispenser tray occupies said second position and has one of said balls resting thereon; and
n. an electrical circuit connected to said source of power, with said circuit including said first electrically operated means, timer, light-emitting means, light-sensitive means, and said first and second switches, with said first electrically operated means being energized by said electrical circuit each time one of said apertures is aligned with said beam of light to allow the latter to impinge on said light-sensitive means to move said ball stop from said first to said second position and allow one of said balls to pivot said dispenser tray from said first to second position to thereafter rest on said dispenser tray, said first switch when said dispenser tray is in said second position assuming an open position to break said circuit to said timer, which second switch when said dispenser tray is in said second position assumes a closed position to energize said sound-generating means to alert a patient to remove a ball from said dispenser tray, which tray when a ball is removed therefrom pivots to said first position to allow said first and second switches to move to closed and open positions respectively, to energize said timer and terminate operation of said sound-generating means.

3,968,901

STRAW DISPENSER

Stanley W. Peva, Jr., Salem, N.H., assignor to Austin-Gordon Design, Inc., Nashua, N.H.

Filed Feb. 14, 1975, Ser. No. 549,880
Int. Cl.² B65H 3/44
U.S. Cl. 221—93 12 Claims



1. A straw dispenser comprising

A. a hopper containing a supply of straws, and

B. a plurality of indexing stations positioned below and in communication with the hopper, each station including
1. a rotary index wheel having a plurality of notches distributed about its periphery, each said notch being shaped and arranged to contain a straw, and
2. a guide plate positioned adjacent the index wheel and extending from a line near the top of the wheel to a line near the bottom thereof so as to trap straws positioned in the wheel notches opposite the guide plate,

C. means for rotating the index wheels in all of the indexing stations intermittently in unison one notch position to advance the uppermost notches in each wheel toward the upper edge of the corresponding guide plate so that the uppermost notches in each wheel can receive straws from the hopper and are rotated under the associated guide plate while the lowermost notches in each wheel are advanced beyond the lower edge of the corresponding guide plate so that any straws therein are free to fall by gravity,

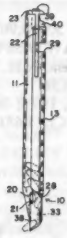
D. straw retaining means positioned directly below each indexing station for orienting each straw vertically and engaging the bottom of each straw dropped from the associated indexing station each time the corresponding index wheel is rotated one notch position, and

E. means for controlling all of the retaining means in unison each time the index wheels are rotated one notch position so as to simultaneously release the set of straws retained therein to a work station as a new set of straws is falling from the index station to the retaining means.

3,968,902
TABLET DISPENSER

Mario E. Bachmann, 2 E. Oak St., Chicago, Ill. 60611

Filed Mar. 17, 1975, Ser. No. 558,900
Int. Cl.² B65D *83/04*
U.S. Cl. 221—263 5 Claims

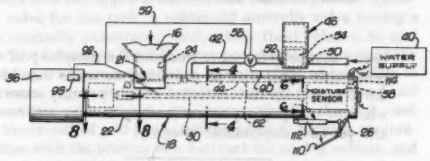


1. A tablet dispenser of elongate tubular form comprising a semicylindrical stationary section, a relatively slidable section of semicylindrical section in edge to edge opposed relation complemental to the stationary section, and a shield of semicylindrical section overlying said slidable section and releasably secured to said stationary section by a snap fit engagement therewith, said stationary section and said slidable section form a storage chamber for containing a supply of tablets and a discharge chamber for holding and dispensing said tablets, said slidable section being movable relative to said stationary section to open said discharge chamber to dispense a tablet, a push button for moving the slidable section, spring means to restore said slidable section and close said discharge chamber after the tablet is dispensed, a top end wall on said slidable section projecting into said stationary section separating said storage chamber from said spring means, said stationary section having an integral projection on the inside surface thereof to tilt said tablets and said slidable section has a sloping guide surface on the inner side thereof to guide the tilted tablets toward said discharge chamber terminating in a stop holding the supply of tablets captive in said storage chamber, an integral interior inclined surface on said stationary section cooperating with said stop to retain a lowermost tablet ready to move into said discharge chamber when said slidable section is restored, and opposing stop means on the stationary and slidable sections to limit the movement of said slidable section to its restored position.

3,968,903
DUST WETTING APPARATUS

William O. Rosentreter, Norwalk; Richard M. Justice, La Mirada, and Timothy E. Wade, Whittier, all of Calif., assignors to Otto H. Rosentreter Co., Bell Gardens, Calif.

Filed Apr. 14, 1975, Ser. No. 567,758
Int. Cl.² B67D *5/14*
U.S. Cl. 222—1 8 Claims



1. A wetting apparatus comprising in combination:
an elongated housing forming a passageway for a finely granulated product to be wetted, said housing having an inlet opening for receiving said product and an outlet opening through which said product may be discharged;
means mounted within said housing for moving said product from said inlet opening to said outlet opening and for mixing;
means connected to said housing and said moving means for operating said moving means;
means connected to said housing and communicating with a supply of water for allowing said product to be sprayed with water;
a gate connected to said housing for variably blocking the outlet opening thereby allowing the volume of said product to be controlled; and
a moisture sensor operatively connected to said gate to control the blocking by said gate of said outlet opening.

8. A method for wetting dust comprising providing a housing having an inlet opening and an outlet opening;
providing a mixing screw and a motor for driving said screw, said screw being placed in said housing;
selectively blocking said inlet opening for metering the input of dust, said metering being a function of dust weight;
selectively introducing water into said housing; and variably blocking said outlet opening in accordance with the wetness of said dust.

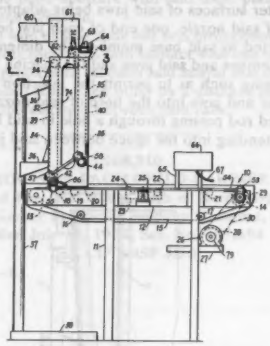
3,968,904
CONTINUOUS MEASUREMENT OF THE BULK DENSITY OF PARTICULATE MATERIAL

Richard Ernest Gartside Neville, Sailsbury, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,208
Claims priority, application United Kingdom, Mar. 12, 1974, 10862/74
Int. Cl.² B67D *5/06*
U.S. Cl. 222—25 13 Claims

1. An apparatus for the continuous measurement of the bulk density of particulate material, comprising a conveyor, means for weighing particulate material on said conveyor, drive means for said conveyor, a measuring column disposed above said conveyor for delivering particulate material to said conveyor, input feeder means for particulate material to said measuring column, a level detection disposed adjacent said measuring column, density indicating means, and a controller for receiving signals from said level detector proportional to the level of the particulate material and for varying the speed

of said drive means in dependance upon said signals to maintain a substantially constant level of material within the measuring column independent of variations of supply to said column; wherein the indicating means is controlled by signals from said weighing means.

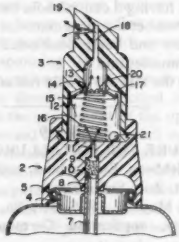


3,968,905

TIME RELEASE AEROSOL DISPENSER

Peter G. Pelton, Carol Stream, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,718
Int. Cl.² B67D *5/08*
U.S. Cl. 222—70 **4 Claims**



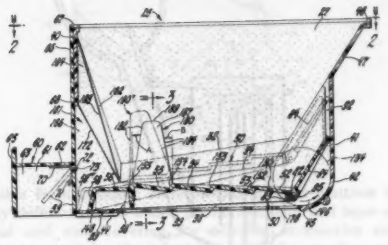
1. An improved timed release dispenser for use with an aerosol container, said dispenser comprising upper and lower body portions, means on said lower body portion for attachment of said dispenser to said container, a measuring chamber formed in said upper body portion, means for regulating the flow of contents from said containers to said measuring chamber, pressure actuated valve means controlling the outflow from said measuring chamber, said valve means comprising a spring disk and supporting spring mounted within said measuring chamber, an exit chamber formed in said upper body portion, an interchamber orifice connecting said measuring chamber and said exit chamber, a spray nozzle operatively connected with exit chamber, said spring disk being concave upward when in the closed condition and concave downward when in the open condition, said measuring chamber being formed with a shoulder encircling said interchamber orifice and said spring disk when in said closed condition seating thereagainst in sealing relation, and a plurality of spaced projections formed on said shoulder, and said spring disk, when in the open condition, is supported on said projections, the spaces therebetween providing passage between said measuring chamber and said exit chamber.

3,968,906

RAM FOR ICE DISPENSING DEVICE

Donald P. Kochendorfer, and Robert S. Hanson, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 8, 1975, Ser. No. 575,588
Int. Cl.² G01F *11/00*
U.S. Cl. 222—243 **1 Claim**

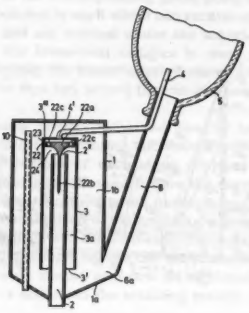


1. An ice piece dispenser comprising a container for receiving and collecting ice pieces, said container including a front wall with a vertically extending chute formed therein communicating with a dispensing opening in said front wall, a longitudinally extending trough formed in the bottom wall of said container with said trough having a planar horizontally disposed base, the forward portion of said trough being subjacent to said chute so as to receive ice pieces therefrom, an elongated ram positioned in said trough, said ram having a forward end face with its lower edge supported on said trough base for reciprocal movement thereon, said ram having its rearward end secured by a pivotal connection to eccentric drive means for movement of said pivotal connection in a circular path, a plurality of steps formed on the upper surface of said ram, whereby eccentric movement of said pivotal connection, through rotation of said drive means, will cause said ram forward end face to move forwardly and rearwardly in a substantially horizontal path in said trough, such that an imaginary line connecting the leading edges of said steps is inclined rearwardly and downwardly when said ram is in an intermediate position, wherein the improvement comprising a vertically extending ice piece agitating fin member formed on the penultimate one of said ram steps, said fin member having a leading edge sloped rearwardly and upwardly from its base, said fin member having a trailing edge sloped forwardly and upwardly from its base, such that upon said ram being reciprocated to its forwardmost position said leading edge approaches a vertical orientation, said trailing edge slope being greater than said leading edge slope when said ram is in its intermediate position, said fin member extending the full longitudinal distance of said penultimate step, said fin member having its side walls converging upwardly from said ram in wedge shape fashion, whereby said fin member leading edge is operative in conjunction with said container front wall chute to break-up ice piece clusters upon the forward thrust of the ram, and whereby the ice pieces collected in said container being operative to exert a vertically downward component of force on said fin sloped edges and side walls to maintain said ram face lower edge in contact with the said trough base during the forward thrust of said ram.

3,968,907
DISPENSER FOR DISPENSING METERED QUANTITIES OF LIQUID FROM A CONTAINER

Maria Nix, nee Saxler, Cologne, Germany, assignor to Norbert Nix, Cologne, Germany

Filed Apr. 9, 1974, Ser. No. 459,356
Claims priority, application Germany, Apr. 11, 1973, 2318120
Int. Cl.² G01F *11/26*
U.S. Cl. 222—416 **4 Claims**



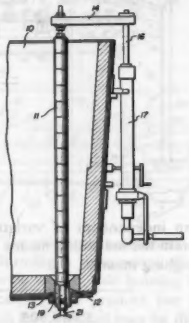
1. A dispenser for dispensing metered quantities of liquid from a container, comprising a housing forming a chamber and having a bottom wall; a discharge tube communicating with said chamber in the region of said bottom wall and having a free end which is spaced from said housing and insertable into a discharge opening of the container; a dispensing tube extending through said bottom wall and including a portion located centrally within said chamber and having an open upper end; an outer tube surrounding said portion of said dispensing tube with clearance and having an open lower end portion communicating with said chamber at said bottom wall, and a closed upper end portion located upwardly of said open end of said dispensing tube and bounding an interior space in communication with said clearance and with said dispensing tube, the distance between said lower open end portion of said outer tube and said open upper end of said dispensing tube being determinative of the metered quantity of liquid dispensed from the container; insert means including an insert member accommodated in said closed upper end portion and subdividing said interior space thereof into an upper air compartment and a lower liquid compartment; passage means for passage of air through said insert means and including at least one opening in said insert member communicating said lower liquid compartment with said upper air compartment; means for replacing the liquid dispensed from the container by air and including an air tube communicating said air compartment with the container; and air vent means communicating said chamber with the exterior of said housing for admitting replacement air into said chamber.

3,968,908
DEVICE FOR PREVENTING LADLE NOZZLE LEAKS

Francis D. Nelson, Munster, and Willard M. Presson, Merrillville, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Oct. 3, 1975, Ser. No. 619,422
Int. Cl.² B22D *41/10*
U.S. Cl. 222—563 **4 Claims**

1. A closure device for preventing leakage of molten metal from a ladle provided with a stopper rod assembly including a stopper rod and a nozzle having a bore which is blocked by said stopper rod to prevent flow of said metal, said device comprising:
a base member;
a pair of spaced elongated generally parallel gripping jaws, the outer surfaces of said jaws being adapted to grip the bore of said nozzle, one end of each jaw being pivotally connected to said base member, the dimensions of said base member and said jaws and the spacing between said jaws being such as to permit the insertion of said base member and jaws into the bore of said nozzle;
a threaded rod passing through a hole in said base member and extending into the space between said jaws, said rod

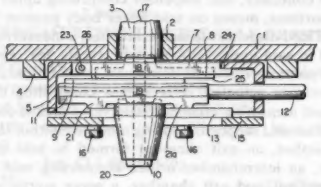


having an enlarged head positioned between said jaws, the width of said head being larger than the spacing between said jaws at the points of connection to said base member, whereby said jaws are forced apart by contact with said head to an extent which increases as said head approaches the points of connection of said jaws to said base member;
a washer plate having a central hole through which said rod passes, said washer having a diameter larger than the bore of said nozzle and being positioned adjacent the outlet end of said nozzle; and
a nut engaging the threads of said rod adjacent said washer.

3,968,909
SLIDE CLOSURE FOR METALLURGICAL VESSELS

Ernst Meier, Kilchberg, Switzerland, assignor to Stopinc Aktiengesellschaft, Zug, Switzerland

Filed May 13, 1975, Ser. No. 577,071
Claims priority, application Germany, May 20, 1974, 2424512
Int. Cl.² B22D *41/08*; B67D *3/00*
U.S. Cl. 222—600 **3 Claims**



1. In a slide closure device of the type including a housing attached to the bottom of a vessel having an outlet opening, a fixed refractory plate fixedly positioned in said housing by means of a metal holding frame and having an aperture aligned with said outlet opening, a refractory slide plate supported on a metal slide within said housing and having an aperture selectively alignable with said aperture of said fixed plate, a housing cover closing the bottom of said housing and having rails for supporting said slide, and means for moving

said slide and said slide plate along said rails to selectively align said slide plate aperture with said fixed plate aperture, the improvement wherein:

each lateral side of said slide has two projections extending downwardly therefrom into contact with one of said rails, said two projections on each said lateral side of said slide being spaced from each other by a distance substantially equal to the distance between said rails.

3,968,910

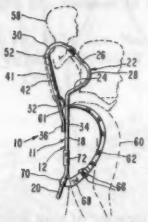
SHOULDER PACK CHILD CARRIER

John Dye, and Paal Myklebust, both of Reedsburg, Wis., assignors to Gerber Products Company, Fremont, Mich.

Filed July 11, 1974, Ser. No. 487,694

Int. Cl.² A45F *3/26*

U.S. Cl. 224—6 **9 Claims**



1. A child carrier adapted to be worn on the back of an individual comprising:

a frame having a pair of spaced, generally rigid, generally parallel side members, each side member having an upper part, a central part, a junction between said central and upper part, and a lower part, a first crosspiece interconnecting the lower parts of said side members, and a second crosspiece spanning the distance between and carried by the side members near the junctions of the central and upper parts thereof, the second crosspiece being operable to limit the movement of the upper parts of the side members toward each other, each upper part having a first segment extending upwardly and rearwardly of the wearer and a second segment extending downwardly from said first segment to such central part; a flexible backrest having a pair of spaced, tubular side margins and a tubular lower end margin formed integrally therewith, each said first segment extending through the respective side margins and the second crosspiece extending through the lower end margin, and strap means coupled with said side members for removably mounting the frame on the back of an individual, such that when the child carrier is mounted to the back of the individual with the side members substantially vertical and each upper part extending relatively above the shoulders of said individual the backrest forms a child-receiving space with the shoulders and head of the individual that causes the weight of the child to bear downwardly upon the shoulders of said individual.

3,968,911

INFANT CARRIER

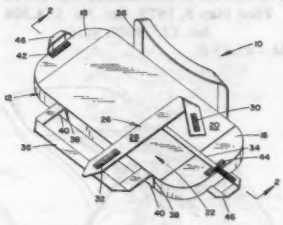
Marta Haas, 2275 Nelson Place, Lakewood, Colo. 80215

Filed Jan. 2, 1975, Ser. No. 537,773

Int. Cl.² A47D *13/02*

U.S. Cl. 224—6 **4 Claims**

1. An infant carrier and mattress comprising a substantially planar pad of resilient material having a length and width substantially larger than an infant and having a thickness such that said pad defines a mattress which assumes a flat configuration for supporting an infant at rest thereon and deforms about the longitudinal axis thereof to partially surround the infant when carried thereon, a water proof covering enclosing said resilient material, a pair of carrying straps connected to each of the respective longitudinal sides of said mattress cover for carrying the infant when supported on the covered mattress, strap means for securing the infant to said cover of said mattress, and a layer of material stitched to said covering along the longitudinal sides thereof only and having a length less than the length of said mattress and said cover and being



accessible from opposite ends of said covered mattress to thereby define an open ended pocket between said layer of material and said covering for carrying accessories and supplies required by the infant, whereby the supplies and accessories may be disposed within said pocket on opposite sides of the infant being carried to thereby maintain the infant centrally of the mattress and cover while the infant rests on the outer side of said layer of material.

3,968,912

BALL AND RACKET CARRIER

Norton Horwitz, 2647 Prindle, Arlington Heights, Ill. 60504

Filed Nov. 11, 1974, Ser. No. 522,493

Int. Cl.² B62J *7/06*

U.S. Cl. 224—36 **3 Claims**

1. A device for carrying a tennis or racquet ball racket and a container of balls on a bicycle, said device comprising:

an upper continuous rod formed into a figure eight configuration having a pair of circular sections one larger than the other;

a lower continuous rod formed into a figure eight configuration having a pair of circular sections one larger than the other, said upper and lower circular sections being equal in size and positioned such that the respective sections are coaxial with each other whereby, the larger coaxially aligned circular sections are adapted to receive the can of balls while the other circular sections are adapted to receive the handle of the racket;

a connecting rod having one end attached to the upper rod and the other end attached to the lower rod, said connecting rod having an element thereof positioned across the larger circular section of the lower rod, wherein said connecting rod element inhibits the can of balls from passing through the larger circular sections of the upper

and lower rods and the smaller circular sections inhibit the racket from passing therethrough; and

means for coupling the device to the bicycle.

3,968,913

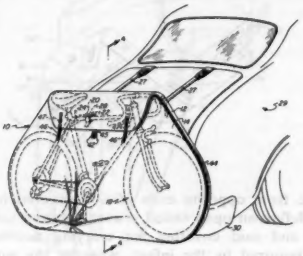
PROTECTIVE COVER FOR AUTOMOBILE MOUNTED BICYCLE CARRIER

Terrance O. Weed, 53 Addison Ave., and Daniel Mougel, 67 Vreeland Ave., both of Rutherford, N.J. 07070

Filed May 5, 1975, Ser. No. 574,304

Int. Cl.[2] B60R 9/10

U.S. Cl. 224—42.03 B **7 Claims**



1. In a system for protecting a two wheeled vehicle such as a bicycle, having a seat and handle bars, while transporting the same on the back of an automobile having a frame affixed to the bumper and to an upper portion of the automobile, the frame being provided with a pair of spaced hangers to receive the bicycle and straps for holding the bicycle to the frame, the improvement comprising:

a back of flexible material having a first pair of openings to permit the spaced hangers to pass therethrough, a second pair and a third pair of openings each of which are positioned to permit one of the straps to pass therethrough to affix the bicycle to the frame;

a front of flexible material affixed at the bottom edge thereof to the corresponding edge of the back;

closure means affixed to the free edges of the front and back to permit them to be joined together to enclose and protect the bicycle from the ambient environment;

the upper portions of the front and back projecting above the top of the two wheeled vehicle to allow for variations in the heights of the seat and handle bars; and

fastening means for securing the joined upper portions of the front and back to the front when said joined upper portions are folded over toward the front.

3,968,914

CONTAINER ASSEMBLY

Antonin Goncalves, Groslay, France, assignor to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 16, 1974, Ser. No. 533,213

Claims priority, application France, Feb. 26, 1974, 74.06432

Int. Cl.[2] B65D 71/00

U.S. Cl. 224—45 AA **12 Claims**

1. In a container assembly comprising in combination a plurality of containers provided with substantially identical caps and a carrier bar defining a corresponding number of openings completely encircled by sleeves, the improvement according to which

said caps have a circular transverse cross section and an external cylindrical surface, each said cylindrical surface carrying a plurality of ridges extending outward of said surface and in the direction of said cylinder, and

said sleeves have closed internal surfaces of revolution mating approximately with said cylindrical external surface, but provided with a different number of ridges having different dimensions which interengage with the ridges on said caps,

said caps and sleeves being made of a resilient material so that said ridges are compressible and the maximum undistended inner diameter of said sleeves being slightly less than the maximum uncompressed outer diameter of said caps, so that when said caps are forced into said sleeve said ridges are compressed and the caps are frictionally retained in said sleeves said caps having an axial length greater than said sleeves.

3,968,915

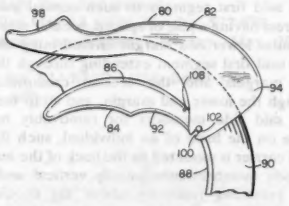
TAPE DISPENSER

Ernst E. Schleicher, 7954-56 MacArthur Blvd., Oakland, Calif. 94605

Continuation-in-part of Ser. No. 490,900, July 22, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,345

Int. Cl.[2] B65H 35/06

U.S. Cl. 225—65 **11 Claims**



1. A tape dispenser for dispensing tape from a conventional tape roll having an annular core, said tape dispenser comprising: a finger grip piece having a crescent configuration insertable within the core of the tape roll, said finger grip piece having a first peripheral portion conforming with a portion of the annular core, and a second peripheral portion adapted for finger contact; a cover piece having a top section with an underside contoured in part to the outer periphery of a tape roll and having opposite side sections covering in part the sides of a tape roll, said top section and side sections forming a tapered extension at one end of said cover piece wherein said underside of said top section in said extension projects a distance substantially tangential from the outer periphery of the tape roll and includes a guide surface for separating tape from the tape roll and a termination with a cutting means; means for hingedly connecting said finger grip piece at one

end of said finger grip piece and said cover piece at said side sections; and tape guide means in said extension wherein said guide means comprises oppositely facing elongated protrusions on the side sections substantially parallel to and proximately spaced from the underside of the top section at the tapered extension, each of said protrusions forming a slot on each of the opposed side sections of the extension and cooperatively providing a channel through which tape is dispensed, said protrusions being spaced apart a distance relative to the width of a tape which causes the tape to deform by bowing which permits the opposite edges of a tape to pass by when the tape is pulled up flatly against the underside of the top section, said protrusions being adapted to engage a narrow portion of the opposite edges of a tape and retain the tape substantially against the underside of the top section at said extension.

3,968,916

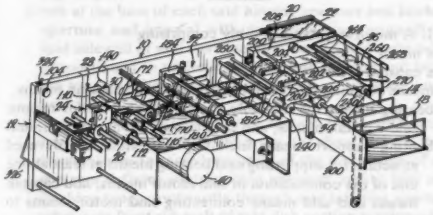
BURSTER

Charles C. Davis, Elgin, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Sept. 16, 1974, Ser. No. 506,190

Int. Cl.[2] B26F *3/00*; B65H *43/06*

U.S. Cl. 225—100 **11 Claims**



1. A burster for separating continuous forms stationary assemblies into individual form lengths, comprising: means defining a path of stationary travel through said burster; two pairs of burster rolls located along said path at spaced locations; a motor for rotating at least one roll in each of said pairs, said motor driving the driven roll in the forwardmost pair along said path of stationary travel at a lesser rate of peripheral speed than the driven roll in the other of said pairs; a conveyor located along said path of stationary travel to receive individual form lengths of the assembly from said other pair of burster rolls; a second motor for driving said conveyor; speed control means for both of said motors for selectively increasing or decreasing the peripheral speeds of said burster rolls and said conveyor; separate means for selectively operating said second motor independently of said first motor to drive said conveyor without driving said burster rolls; a stationary deflecting surface adjacent said conveyor; means for simultaneously adjusting the position of one of said pairs of burster rolls along said path relative to the other and the position of said stationary deflecting surface relative to said conveyor to accommodate business forms having differing individual form lengths; and an electrical control element responsive to said adjusting means and in speed control relationship with said second motor for automatically providing speed compensation for said conveyor for a variety of business forms having differing individual form lengths.

3,968,917

RECORD FEEDING APPARATUS AND METHOD

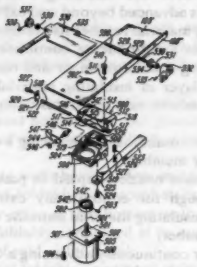
John H. Lanahan, Whitesboro, N.Y., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 30, 1974, Ser. No. 537,629

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—2 **18 Claims**

18. Method of feeding a record having opposite faces terminating at side edges, comprising the steps of: supporting the record for movement along a path, providing an edge guide adjacent the path, providing a rotatable feed wheel having a rotational axis and having a frictional surface in a plane perpendicular to the rotational axis, bringing the record between a pinch point provided by the frictional surface and an opposed back-up member, the pinch point being disposed either upstream longitudinally of the rotational axis and laterally between the rotational axis and the edge or downstream longitudinally of the rotational axis and laterally beyond the rotational axis so that the frictional surface of the feed wheel and



the back-up member are in contact with opposite faces of the record to exert a resultant drive force on the record comprised of a force vector of large magnitude extending in the longitudinal direction for feeding the record longitudinally and a force vector of small magnitude extending in the lateral direction for driving the record laterally to cause its side edge to be in guided contact with the edge guide with concomitant slippage between the frictional surface and the face of the web to prevent the record from buckling laterally, and driving the feed wheel to feed the record longitudinally in guided relationship with the edge guide.

3,968,918

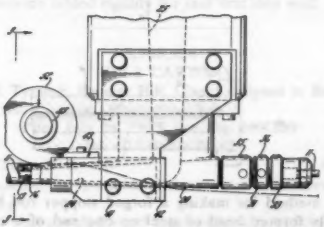
METHOD AND APPARATUS FOR PRODUCING CONTINUOUS LENGTHS OF COAXIAL PRODUCTS

Michel Merle, Elmira, N.Y., assignor to Andrew Corporation, Orland Park, Ill.

Continuation-in-part of Ser. No. 414,696, Nov. 11, 1974, abandoned. This application Nov. 11, 1974, Ser. No. 522,321

Int. Cl.[2] B23K *31/02*, *1/06*

U.S. Cl. 228—148 **13 Claims**



1. A method of producing continuous lengths of coaxial products having concentric inner and outer members and an intermediate layer of insulating material between the inner and outer members, said method comprising the steps of

a. continuously advancing a continuous length of said inner member,

b. continuously forming a concentric layer of the insulating material on the outer surface of said inner member by passing said inner member through an extrusion nozzle while extruding said insulating material through said

nozzle with the radial thickness of the insulating material increasing in the machine direction in a predetermined zone traversed by the advancing inner member,

c. and continuously advancing a continuous flat metal strip alongside said inner member, rolling said strip around said extrusion nozzle to form said strip into an outer member surrounding said inner member, and joining the longitudinal edge portions of the formed strip while the strip is still around said extrusion nozzle and before the insulating material reaches its maximum radial thickness so that the outer member is completed to enclose the inner member and insulating material when the outer member is advanced beyond said extrusion nozzle and the insulating material reaches its maximum radial thickness.

9. Apparatus for producing continuous lengths of coaxial products having concentric inner and outer members and an intermediate layer of insulating material between the inner and outer members, said apparatus comprising the combination of:

a. means for continuously advancing a continuous length of said inner member,

b. an extrusion nozzle adapted to pass said inner member therethrough for continuously extruding a concentric layer of insulating material onto the outer surface of said inner member,

c. means for continuously advancing a continuous flat metal strip alongside said inner member,

d. means for rolling said strip around said extrusion nozzle to form said strip into an outer member surrounding said inner member, and

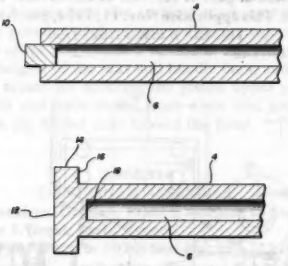
e. means for joining the longitudinal edge portions of the formed strip while the strip is still around said extrusion nozzle so that the outer member is completed to enclose the inner member and insulating material when the outer member is advanced beyond the extrusion nozzle.

3,968,919

METHOD OF FORGING A SOLID HEAD ON A HOLLOW STEEL TUBE

James H. Beijen, Glenwood, Ill., assignor to Fabsco Corporation, Lansing, Ill.

Filed Apr. 2, 1975, Ser. No. 564,286
Int. Cl.² B21J *5/00*
U.S. Cl. 228—153 **3 Claims**



1. A method for making a forged stopper rod having an integrally formed head of steel on one end of a cylindrical steel tube which includes the steps of

selecting a length of hollow steel tubing,

frictionally inserting a cylindrical steel plug of the same grade steel as the steel tube into an open end of the tube so a body portion of the cylindrical plug enters and is frictionally held within the passageway of the tube and a substantial body portion of said cylindrical plug extends beyond the end of the tube,

heating the end of the tube with the extending cylindrical plug beyond the critical temperation of the steel of the plug and tube, and

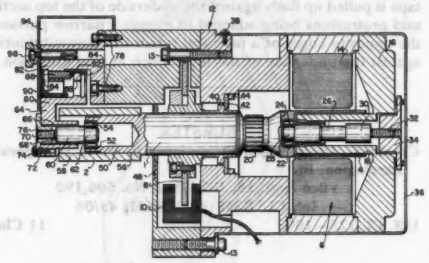
forging the softened cylindrical plug at the end of the tube to form a flattened flanged head integral with the tube.

3,968,920

CAPSTAN AND MOTOR ASSEMBLY

Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 12, 1975, Ser. No. 549,317
Int. Cl.² B65H *17/20*
U.S. Cl. 226—188 **5 Claims**



1. A motor-capstan assembly comprising

a motor means,

a capstan means,

means connecting said motor means to said capstan means,

bearing means for rotatably supporting said motor means, said capstan means, and said last-mentioned means, and

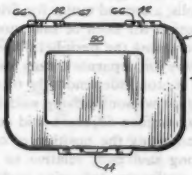
bearing support means including a flexible cantilevered structure for supporting said bearing means at least at one end of the combination of said motor means, said capstan means and said means connecting said motor means to said capstan means.

3,968,921

FOAM PACKAGE FOR BREAKFAST FOODS

Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Aug. 6, 1975, Ser. No. 602,147
Int. Cl.² B65D *43/10, 1/26*
U.S. Cl. 229—2.5 R **5 Claims**



1. A flat foam package for breakfast foods comprising:

a shallow lower dish section having a food support floor and an upstanding peripheral sidewall including front, back and first and second sidewalls which extend upwardly and outwardly from said floor to an upper peripheral wall edge, said lower dish section defining an outwardly extending peripheral flange which circumscribes a major portion of said upper peripheral wall edge and which includes an expansive handle means projecting laterally from each of said first and second sidewalls for carrying said dish section, said floor being proportioned to support said dish section on a table surface, said floor having an inner surface which is relatively hard to resist cutting when food supported on said upper surface is cut;

a relatively flat cover section for covering said dish section, said cover section having a top wall and a sidewall extend-

ing downwardly and outwardly from said top wall to a lower peripheral wall edge, said cover section being proportioned such that a marginal portion of said top wall embraces said flange on said dish section when said cover section is juxtaposed with said dish section;

a hinging mechanism for said dish and cover sections including at least one hinging tongue on said dish section projecting generally rearwardly from said back sidewall, and a complementary hinging aperture defined by said sidewall of said cover section for each hinging tongue, each said hinging aperture opening laterally of the sidewall of said cover section, being positioned adjacent said lower peripheral wall edge, and having a width at least as great as the width of said hinging tongue; and

a latching mechanism for said dish and cover sections including a latching tongue on said dish section projecting forwardly from said front sidewall and lying in a plane substantially parallel to said floor of said dish, and a complementary latching aperture defined by said sidewall of said cover section, said latching aperture opening laterally of the sidewall of said cover section, being positioned adjacent said lower peripheral wall edge, and having a width at least as great as the width of said latching tongue;

a web at the base of each said hinging aperture and latching aperture and integral with and projecting outwardly of said sidewall of said cover section, one of said webs being proportioned to underlie each of said hinging and latching tongues when said cover and dish sections are juxtaposed and latched;

said front sidewall of said dish section being sufficiently resilient when pushed inwardly to allow the latching tongue to be retracted inwardly of the inner edge of the surfaces defining said latching aperture and to bias said latching tongue outwardly through said latching aperture when said front sidewall of said dish section is released so that said latching tongue projects over its associated web, and said sidewall of said dish section maintaining an outward bias against said sidewall of said cover section to maintain said hinging and latching mechanisms in a hinged and latched condition and to help prevent accidental opening of said package.

3,968,922

FRUSTO-PYRAMIDAL BOX WITH HINGED LID

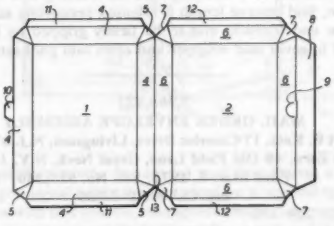
Gunnar Ruud, Lundgardsvei 63, 1700 Sarpsborg, Norway

Filed Mar. 4, 1975, Ser. No. 555,251

Claims priority, application Norway, Mar. 6, 1974, 740778/74

Int. Cl.² B65D *5/26, 5/66*

U.S. Cl. 229—33 **1 Claim**



1. A box having a frusto-pyramidal base and a frusto-pyramidal lid hinged thereto, the box sidewall opposite the hinge having a locking tab thereon, the lid having a support tab foldably connected to the lid sidewall which is opposite said hinge, said support tab having a width such that when the box is closed and the support tab is disposed inside the box, the free edge of the support tab contacts the bottom of the box to support the lid, there being a slot through said lid adjacent said support tab to receive said locking tab.

3,968,923

HOLLOW WALL CARTON CORNER ARRANGEMENT

Richard L. Bell, Phoenixville, and Richard T. Walter, Norristown, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed July 28, 1975, Ser. No. 599,668

Int. Cl.² B65D *5/22*

U.S. Cl. 229—34 HW **5 Claims**

1. In a reinforced, interlocking, corner construction arrangement for a hollow wall carton formed from a unitary blank of foldable paperboard, the combination of:

a. a bottom wall;

b. opposed pairs of hollow first and second side walls upstanding from said bottom wall and joined to each other at the corners of said carton to form a tray open at the top;

c. each of said side walls being hollow and comprising:

i. an outer panel foldably connected at its lower edge to a related side edge of said bottom wall;

ii. a top panel foldably connected at its outer edge to the upper edge of said outer panel;

iii. an inner panel foldably connected at its upper edge to the inner edge of said top panel;

iv. a retaining flap foldably connected at its outer edge to the lower edge of said inner panel, and disposed in full-face engagement with said bottom wall;

d. a first corner flap foldably connected at one edge to an end of said first wall inner panel, and having a reinforcing panel foldably connected thereto along a side edge extending normal to said one edge thereof;

e. a second corner flap foldably connected at one edge to an end of said second wall outer panel, and having a reinforcing panel foldably connected thereto along a side edge extending normal to said one edge thereof;

f. said first corner flap being folded normal to said first wall inner panel and being secured in full-face engagement to the inner surface of said second side wall outer panel;

g. said first corner flap reinforcing panel being interposed between the inner and outer panels of said second side wall to provide added rigidity for said second side wall;

h. said second corner flap being folded normal to said second wall outer panel and being secured in full-face engagement to the inner surface of said first side wall outer panel;

i. said second corner flap reinforcing panel being interposed between the inner and outer panels of said first side wall to provide added rigidity for said first side wall.

3,968,924

BULB CARTON

Walter J. Tyrseck, Quaker Hill, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed July 28, 1975, Ser. No. 599,389

Int. Cl.² B65D *85/42*

U.S. Cl. 229—39 B **4 Claims**

1. A carton for protectively enclosing a bulbous article comprising

A. four wall panels hinged together to form a tube,

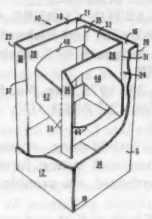
B. a generally U-shaped partition structure within the tube, the legs of said partition structure constituting partition panels spaced generally parallel to a first pair of opposite wall panels,

C. means for hinging opposite side edges of the bridging portion of the U-shaped partition structure to one panel in the second pair of opposite wall panels,

D. means for hinging the free end edges of the legs of the U-shaped structure to the other wall panel in the second pair of opposite wall panels, and

E. a single lateral tongue struck from each partition panel leaving an opening in each partition panel, said tongues

having their roots at the hinges of said bridging portion and leg respectively to the second pair of wall panels, being longer than the width of the bridging portion, and



positioned to extend between the wall panels and an article positioned between the partition panels and received and retained in the openings.

3,968,925

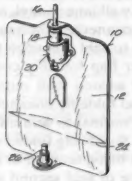
ANTI-REFLUX VALVE

Ray H. Johnston, Greenfield; Bryon L. Mather, Milwakee, and Clark, James L., Whitefish Bay, all of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Filed May 12, 1975, Ser. No. 576,377

Int. Cl.² F16K *15/14*

U.S. Cl. 229—62.5 **4 Claims**



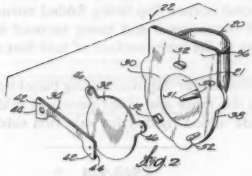


Fig. 2

1. An anti-reflux valve for a fluid drainage bag comprising:

a connector member fastened to a wall of said bag and having an inlet port communicating with the inside of said bag;

a valve seat surface on said connector member surrounding said inlet port thereof;

a flexible valve element mounted on said connector member on the inside of said bag and generally overlying said valve seat surface at said inlet port, said valve element being of generally circular shape and having two radially extending ears; and

valve element retaining means for retaining said valve element on said connector member, said valve element retaining means including a retaining member in the form of a strip of plastic material having a pair of end portions with the edges of said end portions bonded to said connector member to form a pair of retaining pockets in which said radially extending ears of said valve element are slidably captured so that said valve element will be retained for limited relative transverse movement with respect to said valve seat surface, said valve element adapted for movement to an open position upon flow of fluid through said inlet port into the bag and further adapted for movement to a closed position into sealing engagement with said valve seat surface in response to fluid pressure exerted on said valve element from inside the bag.

3,968,926

TEARSTRIP PACKAGE

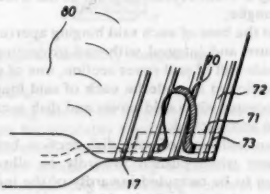
Albert Emiel Smolderen, Aartselaar, and Joseph Marie Cappuyns, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 192,021, Oct. 26, 1971, Pat. No. 3,795,080. This application Oct. 26, 1973, Ser. No. 409,966

Claims priority, application United Kingdom, Oct. 26, 1970, 50835/70

Int. Cl.² B65D *5/54*

U.S. Cl. 229—66 **3 Claims**



1. A package comprising a wrapping of flexible sheet material sealed along side edges to form a flat tube and having the front and rear marginal strip portions transversally sealed together along end edges of said material, a tearstrip for opening said wrapping disposed lengthwise inside said wrapping with its ends embedded within the respective sealed together marginal strip portions, said tearstrip having a length exceeding the overall length of said wrapping to provide a reserve tearstrip length intermediate said embedded ends, a corner section of at least one of said sealed marginal portions which has the tearstrip end embedded therein being connected to the remainder of said marginal portion through a line of weakening, and an opening in said sheet material spaced from the end edges of said sealed material and adjacent said weakened corner section through which opening said reserve tearstrip length projects exteriorly in the form of a loop, whereby when said corner section is manually separated from said package along said line of weakening with the tearstrip end embedded therein, said reserve length is released permitting said corner section and tearstrip end to be firmly gripped by hand and pulled to sever said wrapper and open said package.

3,968,927

MAIL ORDER ENVELOPE ASSEMBLY

Robert E. Katz, 17 Camelot Drive, Livingston, N.J. 07039, and Leo Zern, 48 Old Field Lane, Great Neck, N.Y. 11020

Filed Mar. 5, 1975, Ser. No. 555,340

Int. Cl.² B65D *27/00*

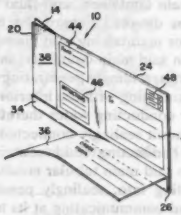
U.S. Cl. 229—70 **5 Claims**

1. A pre-printed mail order envelope assembly, comprising:

a. a single pre-printed elongated sheet folded along two parallel fold lines to give three superposed rectangular panels, both ends of each panel being in registry with the corresponding ends of the other panels,

b. a major portion of the intermediate panel and the opposed portion of one outside panel, forming opposed, elongated envelope sections which extend from one end of the pre-printed sheet and which are of the same width,

c. a strip of adhesive disposed between said opposed envelope sections adjacent and parallel to their one end and joining them together to form the bottom of an envelope,
d. the two parallel fold lines forming elongated side edges of the envelope,
e. the remaining part of one of the panels having an envelope section being an envelope flap to which glue has been applied,
f. the remaining part of the other of the panels having an envelope section being an address coupon which is separated from its envelope section by a transverse perforate line,
g. the envelope flap and the address coupon being separated from each other along two slits which extend from and are in alignment with the two parallel fold lines,



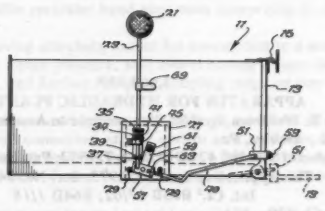
h. a glue strip disposed between the intermediate and the other outside panel adjacent one of said fold lines, said fold line connecting the two outside panels together, said glue strip joining said other outside panel and said intermediate panel together along that side,
i. the third panel being a coupon which is separable from the envelope along a perforate line extending parallel and adjacent to the glue strip for the entire length of said other outside panel,
j. the glue strips being applied to the surface of the single pre-printed sheet such that they are disposed on only one side thereof prior to folding,
k. the outside surfaces of the two outer panels containing printed advertising material.

3,968,928

MAIL BOX ROTATABLE SIGNAL

Victor L. Caldwell, R.D. No. 1, Medina, N.Y. 14103

Filed Mar. 21, 1975, Ser. No. 560,621
Int. Cl.² B65D *91/00*
U.S. Cl. 232—35 **7 Claims**



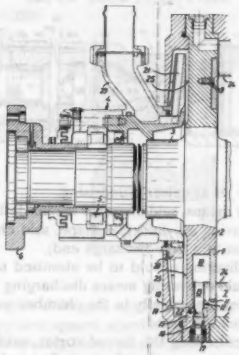
1. A signalling device for a rural mail box having a door comprising: a signal adjustably mounted on a vertical spindle for rotation with said spindle, said spindle having its lower end bent to project substantially horizontally; a pull rod detachably and pivotally connected at one end to said door and adapted to be moved in generally horizontal, opposite directions as said door is opened or closed; said spindle and said pull rod being operatively connected by a pivotally mounted yoke, said yoke having a lug thereon adapted to engage said bent lower end of said spindle whereby to turn said spindle only when said lug is moved in one direction by opening of said door but not engaging said spindle when said lug is moved in the other direction by subsequently closing said door, said yoke having an adjustable connection with the other end of said pull rod whereby to vary the movement of said yoke.

3,968,929

CENTRIFUGE

Henry Frederik Olesen, Lyngby, Denmark, assignor to Titan Separator A/S, Soborg, Denmark

Filed Apr. 15, 1975, Ser. No. 568,352
Claims priority, application Germany, Apr. 22, 1974, 2419355
Int. Cl.² B04B *11/00*
U.S. Cl. 233—21 **7 Claims**



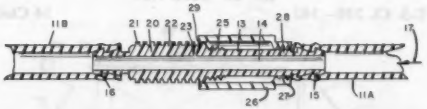
1. A centrifuge comprising means defining a separating space having an end wall and a peripheral wall, means for introducing a raw material into said separating space, a discharge chamber separate from said separating space, at least one liquid flow conduit connecting said separating space with said discharge chamber and having a liquid inlet end opening into said separating space, said liquid inlet end being formed by an insert mounted in an outer wall of the centrifuge and accessible for replacement from the outside of said outer wall, and a skimmer disc mounted in said discharge chamber for withdrawing liquid therefrom.

3,968,930

DRIP IRRIGATION DEVICE

Ralph L. Hendrickson, 3649 Noble Ave. North, Robbinsdale, Minn. 55422

Filed Mar. 31, 1975, Ser. No. 563,721
Int. Cl.² B05B *15/02*
U.S. Cl. 239—107 **10 Claims**



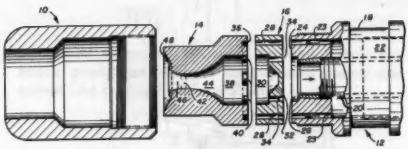
1. A device for providing a restricted flow of a fluid comprising a core having opposite ends, means to attach the core member to a source of a fluid, said core member having an interior passageway carrying said fluid, a discharge passageway leading from the interior passageway of said core member to the exterior thereof, and a housing member overlying portions of said core member when in a first position, means cooperating between said housing member and the exterior of said core member to define an enclosed restricted flow path from said discharge passageway to atmosphere, said core

member and said housing being of relative length so that said housing can be shifted axially relative to said core member to a second position where substantially all of said restricted flow path is uncovered for cleaning while said housing is located between the ends of the core member and the core member is attached to the source of fluid.

3,968,931
PRESSURE JET ATOMISER

Donald A. Smith, Haddam, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 6, 1975, Ser. No. 619,975
Int. Cl.² B05B 9/00, 1/34
U.S. Cl. 239—125 **25 Claims**



1. A pressure jet atomiser comprising:

swirl chamber means, said chamber means defining a vortex chamber having a cylindrical shape, said chamber being open at least at a first discharge end;

means for delivering a fluid to be atomised to said vortex chamber, said delivering means discharging the fluid into said chamber tangentially to the chamber wall whereby a forced vortex is formed;

means for accelerating the forced vortex, said accelerating means being connected to the open first end of said cylindrical vortex chamber and having a smooth curved contracting passage therethrough, said passage being coaxial with said chamber whereby the diameter of the forced vortex exiting said chamber is reduced at a decreasing rate;

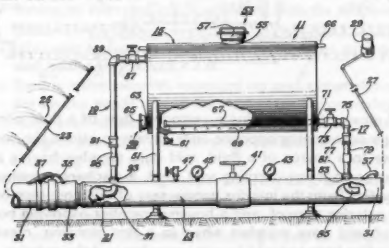
a diffuser, said diffuser having a smoothly curved wall which diverges away from an extension of the axis of said cylindrical vortex chamber and accelerating means passage; and

means defining a nozzle throat, said throat coupling the minimum diameter downstream end of said accelerating means to the minimum diameter upstream end of said diffuser, said throat having a constant diameter, the wall of said throat being tangent to the walls of said accelerating means passage and said diffuser.

3,968,932
APPLICATOR

Ardean Kimmell, Rte. 3, DeLeon, Tex. 76444

Filed Nov. 3, 1975, Ser. No. 627,944
Int. Cl.² B05B 7/24
U.S. Cl. 239—142 **14 Claims**



1. An applicator for applying chemicals to soil and the like comprising:

a. a section of main tubular conduit having at its respective ends connection means for being connected into an irrigation line having a plurality of sprinklers connected with a source of pressurized water;

b. a main container disposed adjacent said main tubular conduit;

c. fill means for filling said main container with said chemicals to be applied to said soil; said fill means being disposed adjacent the top of said main container and communicating with the interior thereof;

d. drain means for draining said main container; said drain means being disposed adjacent the bottom of said main container and communicating with the interior thereof;

e. fluid inlet conduit disposed linearly of said main container adjacent the bottom thereof for conducting water into said main container; said fluid inlet conduit having spray means directed toward the bottom of said main container for maintaining said chemicals agitated in said water within said main container; said fluid inlet conduit extending into, sealingly penetrating through side walls of and communicating with the interior of said main tubular conduit for conducting water therefrom;

f. effluent conduit sealingly connected with said main container for conducting fluid containing said chemicals therein into said main tubular conduit; said effluent conduit extending into, sealingly penetrating through side walls of, and communicating at its terminal end with the interior of said main tubular conduit for dispensing certain chemicals thereinto;

g. admixing nozzle means connected with said terminal end of said effluent conduit within said main tubular conduit for effecting dilute, substantially uniform admixture of said chemicals at widely varying flow rates and widely varying pressures; said admixing nozzle means including an entry chamber having a plurality of apertures for dispensing said fluid containing said chemicals, and having a flaring skirt portion directed downstream and extending radially outwardly to within a distance of said side walls of said main tubular conduit sufficient to cause turbulence immediately downstream of said apertures in said admixing nozzle means and back pressure on said fluid inlet conduit adequate to effect substantially uniform admixture of said chemicals at said widely varying pressures and flow rates;

whereby substantially uniform application of said chemicals is made on a field having even large elongate dimension.

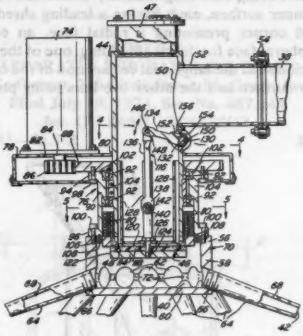
3,968,933
APPARATUS FOR HYDRAULIC PLANTING

John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 422,817, Dec. 7, 1973, Pat. No. 3,920,184.
This application Jan. 27, 1975, Ser. No. 544,091
Int. Cl.² B05B 17/02; B64D 1/18
U.S. Cl. 239—171 **19 Claims**

1. Apparatus for dispensing a suspension of particulate matter and an elastic carrier fluid in a well defined area on the ground from above the ground, said apparatus comprising, a spray head and means for rotating said spray head, said spray head having a common central chamber having an entrance, with plural nozzles projecting radially therefrom and in fluid communication therewith, each of said nozzles including an open orifice and with no valve means between said chamber and said orifices, means for feeding the suspension to said chamber, and a common valve at the entrance of said chamber and in fluid communication with said feeding means and said chamber for adjusting the rate at which said suspension

is supplied to said chamber, whereupon said suspension is enabled to freely flow through said valve means, said chamber



and out of said open orifices as the result of the rotation of said spray head.

3,968,934

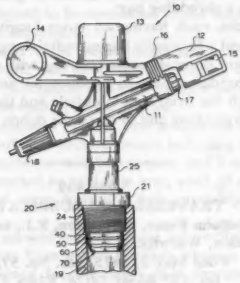
SPRINKLER HEAD BEARING MEANS

Mark Healy, 1738 Blossomwood Lane, Orlando, Fla. 32808

Filed July 7, 1975, Ser. No. 593,373

Int. Cl.² B05B *3/14*; F16L *19/00*

U.S. Cl. 239—230 **16 Claims**



1. A rotatable sprinkler head apparatus comprising in combination:

a swivel having attaching means for connection to a source of water under pressure, said swivel having a bore therethrough, and further having a coupling ridge on one end thereof;

spindle means movably mounted through said bore of said swivel and connected at one end to said sprinkler head apparatus, said spindle means having a flange at the opposite end thereof, and further having a bore between its ends;

wear washer means located on said spindle means and being located between said flange and said coupling ridge of said swivel;

a first seal located on said spindle means between said coupling ridge of said swivel and said wear washer means, said first seal having on one side thereof a first lip extending about the edge portion thereof overlapping said coupling ridge of said swivel, and first seal having a second lip extending about the edge portion thereof on the opposite side thereof and overlapping with said wear washer means;

a second seal located on said spindle means between said flange and said wear washer means, said second seal having a first lip on one side thereof extending about the edge portion thereof overlapping said wear washer means, with said second seal having further a second lip on the opposite side thereof extending about the edge portion thereof and overlapping said flange section of said spindle means, whereby surfaces of said wear washer, said spindle means, and said swivel are protected from the entry of sand or other contaminants.

3,968,935

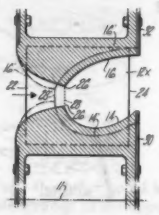
CONTOURED SUPERSONIC NOZZLE

John S. Sohre, 1 Lake View Circle, Beaver Lake, Ware, Mass. 01082

Continuation-in-part of Ser. No. 362,402, May 21, 1973, abandoned. This application July 24, 1974, Ser. No. 491,392

Int. Cl.² B05B *15/00*, *17/00*

U.S. Cl. 239—289 **23 Claims**



1. A convergent-divergent nozzle including:

a pair of opposed spaced apart side walls;

a top wall extending between said side walls; and

a bottom wall spaced from said top wall and extending between said side walls;

said top and bottom walls and said side walls cooperating to define a flow passageway; and

said top and bottom walls being contoured to cooperate with each other to define at least the throat of the nozzle and a divergent section downstream of the throat, said contouring of said top and bottom walls defining a symmetric flow passage therebetween in the direction of flow downstream of said throat.

3,968,936

AIR OUTLET APPARATUS

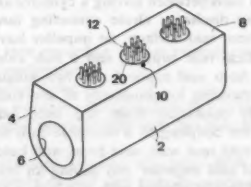
Josef Brühlmeier, Wettingen, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Sept. 30, 1974, Ser. No. 510,429

Claims priority, application Switzerland, Oct. 8, 1973, 14306/73

Int. Cl.³ B05B *1/14*

U.S. Cl. 239—550 **5 Claims**



1. An air outlet apparatus comprising an air compartment, a plate bounding said air compartment, said plate being provided with openings distributively arranged over its length, each of the openings in the plate possessing an essentially circular-shaped configuration and bounded by an edge means, each of said openings being sealingly occupied by a detach-

ably secured nozzle block, each nozzle block containing a number of protruding nozzles, each nozzle block possessing a flange which engages over the plate and cam means which engage beneath the plate for detachably securing each nozzle block inserted into one of said openings at the plate, the cam means of each nozzle block being formed at the region of a substantially cylindrical portion of the nozzle block which is bounded in axial direction by the flange, and each of the edge means bounding the associated opening in the plate possess recesses which permit the throughpassage of the cam means.

3,968,937

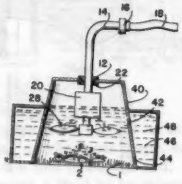
DROPPING DISPOSING

Gaylord R. Miller, 6561 Hawaii Kai Drive, Honolulu, Hawaii 96825

Filed Apr. 19, 1974, Ser. No. 462,503

Int. Cl.[2] B02C *19/12*

U.S. Cl. 241—5 **10 Claims**



7. The method of disposing of droppings comprising placing a chamber over the droppings and spinning water into the chamber; solubilizing the droppings, dissolving the droppings, flowing water from the chamber into a ballast tank and holding water within the ballast tank and the chamber while dissolving the dropping, and lifting the chamber from the droppings and flowing the dissolved droppings and water from the chamber, and dispersing the solution.

3,968,938

SYSTEM FOR HANDLING DEBRIS

Walter Franklin Ruhl; Albert W. Nelson; Jesse J. Lucy, all of Greenville, Ohio, and Gerald N. Marshall, Union City, Ind., assignors to Lambert Corporation, Dayton, Ohio

Filed Sept. 10, 1974, Ser. No. 504,484

Int. Cl.[2] B02C *18/06*

U.S. Cl. 241—101.1 **5 Claims**

1. A system for handling debris, such as leaves, twigs, refuse and the like, convertible for use as a blower or as a vacuum, comprising:

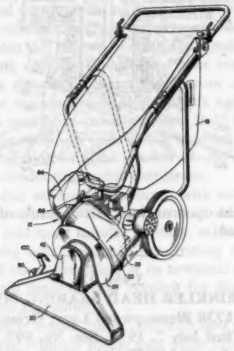
a wheeled frame;

a device mounted on said frame including an impeller housing having a vertical rear wall, a vertical front wall and a side wall therebetween having a cylindrical inner surface and a top discharge chute extending tangentially outwardly from said surface, an impeller having a circular disc vertical rear support and a hub extending axially forward from said support and two substantially radial blades extending longitudinally of and substantially diametrically outwardly from the hub, said hub being adapted for coupling to a rotatable stub shaft extending through said rear wall, said front wall being spaced forwardly of said impeller and having an inlet hole larger than and axially aligned with said hub, a vacuum nozzle connected to and extending forwardly and downwardly from said front wall past said front wall and said frontwall inlet hole and having a front inlet hole in axial alignment with said front wall inlet hole;

an intake device optionally and removably mounted on said vacuum nozzle over said front inlet hole to allow for flow through said front wall inlet hole;

an exhaust device optionally and removably mounted on said discharge chute to allow exhaust flow therethrough;

three shredding bars longitudinally connected to the housing inner surface, each having a leading shredding elongated corner presenting a radial face, an edge and a peripheral face for debris shredding, one of the bars being positioned at the tangential connection of the chute to the inner surface and the other two bars being positioned at



120° locations therefrom so that only one blade at a time passes a shredding bar;

said blades each having an outer longitudinal peripheral edge and a forwardly flaring radial flange extending in the direction of rotation for coacting with said inner surface and shredding bars to produce an air and debris flow through the front wall inlet hole and the housing and the discharge chute and to shred the debris while in the housing.

3,968,939

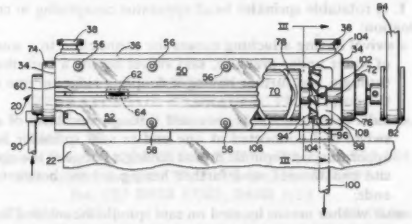
TRAVERSE CAM LUBRICATION

William Malcolm Bense, Barrington, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed May 2, 1975, Ser. No. 573,873

Int. Cl.[2] B65H *54/28*; F16N *17/06*

U.S. Cl. 242—43 R **5 Claims**



1. In a traverse mechanism for winding apparatus the combination comprising, a housing having an elongated slot therein, an elongated member supported on a shaft rotatably journaled in said housing, said member being operatively connected with a strand guide, said guide extending through said slot and reciprocated from end to end of said slot on rotation of said member in a position to engage and traverse an advancing strand onto a rotating package, means for introducing oil mist into one end of said housing, and an impeller mounted on said shaft near the other end of said housing adjacent vent means whereby on rotation of said member said impeller creates a zone of reduced pressure within said hous-

ing thereby drawing said oil mist within the housing and directionally away from said slot and venting the pressure through said vent means.

3,968,940

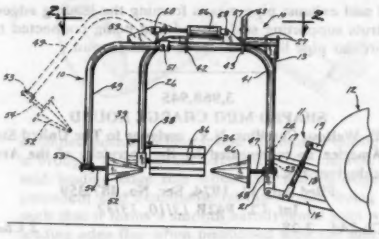
APPARATUS FOR HANDLING BALES

Byron L. Godbersen, 710 Circle Drive, Ida Grove, Iowa 51445

Filed July 10, 1974, Ser. No. 487,244

Int. Cl.² B65H *17/06, 75/42*

U.S. Cl. 242—86.5 R **18 Claims**



18. An apparatus for attachment to the three-point hitch of a tractor for handling round bales comprising:

frame means adapted to be connected to the hitch for vertical movement thereby;

first means secured to the frame means and extended rearwardly therefrom, said first means including a rotatable drum the axis of rotation of which extends parallel to the direction of movement of the tractor;

second means mounted on said first means for movement laterally thereof, said second means including a first arm pivotally mounted on said first means, and a second arm pivotally connected to said first arm, each of said pivotally connected arms having a hub rotatably mounted thereon;

means mounted on said second means for pivotally moving said second arm from a first position wherein said hubs are axially aligned for holding a bale therebetween in engagement with said drum, to a second position wherein said second arm and its hub are spaced upwardly and away from the other arm and hub; and

means for axially rotating said drum to unroll the bale completely until it is gone from between said hubs, said second means freely movable toward said first means as the bale is unrolled.

3,968,941

INTERBIASED DOUBLE TAPE SPOOL ASSEMBLY

Kenneth A. Catto, Beaverton, Oreg., assignor to Telephonax, Inc., Portland, Oreg.

Filed Apr. 4, 1975, Ser. No. 565,203

Int. Cl.² G03B *1/04*; G11B *15/32*

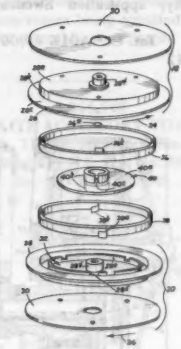
U.S. Cl. 242—193 **10 Claims**

1. A tape spool assembly for accommodating reversible movement of a magnetic recording tape, or the like, comprising

a pair of spools for carrying such a tape mounted in side-by-side relation for rotation on a common axis,

a plate positioned between said spools and mounted for rotation relative to both spools on the same common axis, and

a pair of biasing means with one operatively interposed and acting between said plate and one of said spools tending to urge relative rotation therebetween in one direction, and with the other operatively interposed and acting



between said plate and the other spool tending to urge relative rotation therebetween in the opposite direction.

3,968,942

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

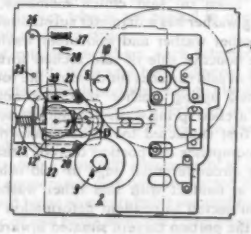
Günter Wrobel, Villingen, and Georg Papst, St. Georgen, both of Germany, assignors to Papst-Motoren KG, Germany

Filed Oct. 21, 1974, Ser. No. 516,782

Claims priority, application Germany, Oct. 26, 1973, 2353856

Int. Cl.² G03B *1/04*; G11B *15/32*

U.S. Cl. 242—204 **19 Claims**



1. Magnetic tape recording and/or reproducing apparatus comprising in combination:

two tape winding hubs;

a first electric motor for driving said hubs and having a drive shaft disposed non-coaxially with the rotational axes of said hubs;

means for selectively coupling the drive shaft of said first motor to either one of said hubs depending on the required direction of movement of a magnetic tape;

a tape drive capstan;

and a second electric motor for driving said tape and having a drive shaft coaxial with and coupled to said capstan, said second motor being generally flat in shape, having at least four pairs of poles, and being disposed at substantially the same level and alongside said first motor.

3,968,943

SLIDING CLUTCH FISHING REEL

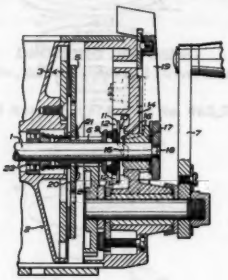
Åke Eugen Murvall, Svangsta, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed Dec. 4, 1974, Ser. No. 529,378

Claims priority, application Sweden, Nov. 20, 1973, 7315660

Int. Cl.² A01K 89/00

U.S. Cl. 242—212 5 Claims



1. A fishing reel comprising a rotatable part, a hand crank, a transmission and an adjustable clutch in said transmission for connection of said crank with said rotatable part with an adjustable sliding force, said clutch comprising two clutch members, at least one of which is movable in relation to the other to and from a fully inter-engaged position of said clutch members, adjustable spring means for exerting adjustable resilient inter-engagement force on said sliding clutch members, and adjusting means for adjusting said spring means and thereby adjusting said inter-engagement force of said sliding clutch, said spring means comprising two washers mounted coaxial and relatively movable, one of said washers being an arched spring washer mounted between and in contact with two surfaces, one of which is movable by said adjusting means to press said spring washer with adjustable force against the other surface for exerting said adjustable resilient inter-engagement force on said clutch members, wherein said arched spring washer has a diameter substantially greater than that of the other washer and said other washer is mounted between the concave side of said arched spring washer and adjacent one of said surfaces for dividing the total spring plane of the arched spring washer into two coaxial portions, whereby the arched spring washer, when pressed between said surfaces, is first subjected to resilient deformation over an area which comprises the portion thereof situated outwardly of the outer circumferential edge of said other washer and then, when in contact with said other washer and further pressed, is subjected to resilient deformation restricted substantially to the portion thereof situated inwardly of the outer circumferential edge of the said other washer.

3,968,944

AIRCRAFT WITH SHROUDED PROPELLER DRIVE

Friedhelm Zimmer, Markdorf, and Zimmer Herbert, Friedrichshafen, both of Germany, assignors to Dornier GmbH, Germany

Filed Feb. 27, 1975, Ser. No. 553,611

Claims priority, application Germany, May 31, 1974, 2426628

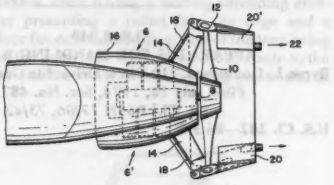
Int. Cl.² B64D 33/06

U.S. Cl. 244—1 N 1 Claim

1. In an aircraft having a tail-mounted, shrouded pusher-type propeller and an engine mounted in front of the shroud,

the improvement comprising exhaust pipe means running from said engine to said shroud,

said shroud having sound absorbing means therein including a plurality of means connected to individual cylinders or cylinder groups,



and said exhaust pipe means forming the leading edges of struts supporting said shroud and being connected to a circular pipe line in the nose of the shroud.

3,968,945

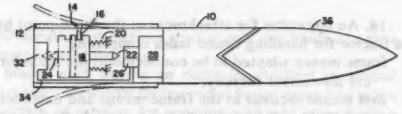
SHAPED MINI CHARGE ROUND

John E. Walton, Camillus, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,359

Int. Cl.² F42B 13/10, 13/32

U.S. Cl. 244—3.28 2 Claims



1. A mini charged round having a shaped charge for destroying incoming mortar, rocket and artillery shells, said round comprising: a case having a plurality of spring fins attached on the outside thereof; an inertia block mounted for axial movement within said case; means for exerting a force on said block; said block being provided with a recess therein; a locking pin attached to one of said fins for entering said recess and preventing axial movement of said block; said round including a charge and means for igniting said charge positioned forward of said block; means carried by said block for striking said ignition means; delay ignition means in said case and means for striking and igniting said delay ignition means, said means for igniting said delay ignition being a striker carried on the rear side of said block.

3,968,946

EXTENDABLE AERODYNAMIC FAIRING

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 31, 1975, Ser. No. 563,297

Int. Cl.² B64C 7/00

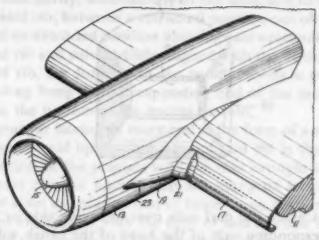
U.S. Cl. 244—42 D 6 Claims

1. An extendable aerodynamic fairing suitable for use between an engine nacelle and a wing leading edge flap for filling the gap between said engine nacelle and said wing leading edge flap when said wing leading edge flap is extended, said extendable aerodynamic fairing comprising:

a fixed fairing section attached to said engine nacelle in an aerodynamic manner, said fixed fairing section starting at a point on the outer surface of said nacelle substantially forwardly of the leading edge of the wing with which said leading edge flap is associated and flairing outwardly toward the upper and lower surfaces of said wing, said fixed fairing section also diverging outwardly into a plateau spaced from said nacelle, a cavity formed in said plateau, said cavity having an opening generally aligned

with said leading edge flap when said leading edge flap is extended; and,

an extendable fairing section mounted in said cavity in said fixed fairing section for lateral movement between a retracted position whereat said extendable fairing section is substantially entirely housed within said cavity and an



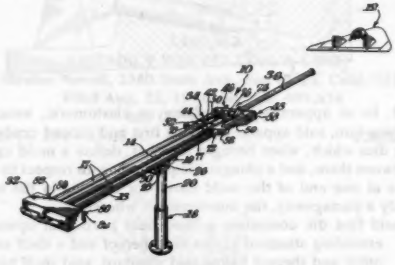
extended position whereat said extendable fairing section is brought to a position adjacent to the nearest edge of said leading edge flap when said leading edge flap is extended, said extendable fairing section being formed such that it forms a smooth aerodynamic joint with said leading edge flap when positioned adjacent said leading edge flap and the leading edge flap is extended.

3,968,947

LAUNCHING APPARATUS FOR FLYING DEVICE

William R. Schlegel, Wilmington, Del., and John J. Hennessey, Springfield, Pa., assignors to All American Industries, Inc., Tomaston, Conn.

Filed Jan. 14, 1975, Ser. No. 540,864
Int. Cl.² B64F *1/06*
U.S. Cl. 244—63 **25 Claims**



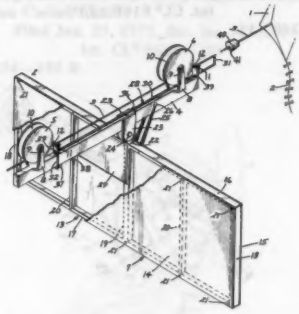
1. A launching apparatus for a flying device comprising an elongated telescopic tube assembly, said telescopic tube assembly being mounted upon a support and having rear and front ends, said telescopic tube assembly having a rear open end and a closed front end having at least one stationary tube and at least one movable launching tube, a hollow space within said telescopic tube assembly, a base, a receiver of pressurized fluid being directly connected to said hollow space by conduit means, said conduit means having cross-sectional area large enough to substantially prevent throttling when said pressurized fluid expands, latching means securing said launching tube to said base for restraining said launching tube to said base against the force of said pressurized fluid, bracket means on said launching tube for connection of the forward motion of said launching tube to said flying device, latch release means connected to said latching means for allowing said launching tube to be propelled forward in a full launching stroke in response to the expansion of the pressurized fluid whereby said flying device connected to said launching tube is rapidly propelled toward and past said front end of said telescopic tube assembly to launch said flying device into the air, said receiver of pressurized fluid being sufficient in conjunction with said hollow space to provide said full launching stroke, a source of pressurized fluid connected to said receiver and said latch release means being actuated after said receiver and telescopic tube assembly are charged with said pressurized fluid.

3,968,948

KITE ACCESSORY TOY

Willard C. Schmidt, 713 W. 7th St., Willmar, Minn. 56201

Filed June 4, 1975, Ser. No. 583,596
Int. Cl.² B64C *31/06*
U.S. Cl. 244—155 R **1 Claim**



1. A kite accessory toy comprising:

a. an elongated body;

b. a pair of brackets each mounted on said body adjacent a different end of said body and projecting upwardly from said body;

c. a pair of trolley wheels each rotatably mounted in a different one of said brackets above said body, said trolley wheels having aligned circumferential radially outwardly opening grooves for reception of a kite string when the trolley wheels are placed in overlying engagement with said kite string;

d. a pair of retainer members, each retainer member projecting upwardly from said body adjacent a different one of said trolley wheels and disposed to closely underlie the kite string when said trolley wheels are in rolling engagement with the kite string, to retain the kite string in said trolley wheel grooves;

e. a sail extending generally transversely of said body;

f. a pair of cooperating pivotally connected hinge elements, one of said hinge elements being secured to said body and the other of said hinge elements being secured to said sail, said hinge elements hingedly mounting said sail to said body in underlying relationship to the body for swinging movements of the sail on a normally horizontal axis extending transversely of said body and between an operative position of said sail in a plane generally normal to the longitudinal dimension of the body and a folded position in a plane generally parallel to said longitudinal dimension;

g. yielding means urging said sail toward said folded position thereof;

h. an elongated latch element having a portion extending longitudinally of said body in overlying relationship to said body, said retainer members having openings therein supporting said latch element portion for sliding movements longitudinally of said body, said latch element having one end portion disposed longitudinally outwardly of one end of said body and in closely spaced relation to the kite string when said trolley wheels are mounted on

the kite string, said latch element having an opposite end underlying said body;

i. a stop element adapted to be mounted on the kite string for abutting enngagement with said one end portion of the latch element;

j. and a stop member on said sail disposed to engage said body to limit swinging movement of said sail toward its operative position, said stop member having a lip portion engaged by said opposite end of the latch element to releasably hold the sail in said operative position thereof.

3,968,949

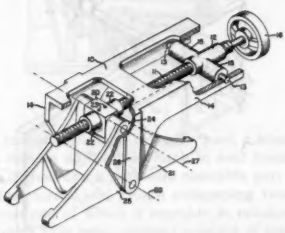
PROJECTOR TILT MECHANISM

Frank A. Romano, Jr., Syracuse, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed July 18, 1974, Ser. No. 489,759

Int. Cl.² F16F *15/00*

U.S. Cl. 248—11 **18 Claims**



1. A mechanism having a platform for tilting a load carried on said platform, comprising:

a threaded shaft;

support means engaging said shaft and coupled to said platform so as to maintain said platform generally at a predetermined position with respect to said shaft;

a base, having first and second ends, said base being pivotable about said first end thereof for affecting movement of said platform in a first direction, said base being pivotable about said second end thereof for affecting movement of said platform in a second direction, said base pivoting responsive to the rotation of said shaft; and

threaded means pivotably mounted about an axis at a first location upon said base so as to be free to rotate through a first plane substantially orthogonal to said axis, said threaded means engaging said threaded shaft, said threaded means and said threaded shaft being rotatable relative to each other,

said platform being pivotally mounted at a second location upon said base, spaced apart from said first location so as to be free to rotate through a second plane substantially parallel to said first plane.

3,968,950

COMBINATION SUPPORT AND GUARD FOR A TOOTHBRUSH

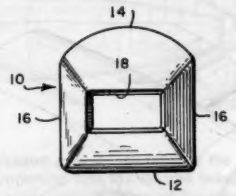
George T. Gallo, 15 Cataldo Drive, Revere, Mass. 02151

Filed Apr. 10, 1975, Ser. No. 566,668

Int. Cl.² F16M *13/00*; **A46B** *17/00*

U.S. Cl. 248—359 **4 Claims**

3. A combination support and guide for a toothbrush comprising, a part having a rigid periphery within which there is an elastically enlargeable opening for receiving the handles of toothbrushes having handles of different cross section, said peripheral surface embodying a straight bottom edge symmetrical with respect to the opening and spaced from the center thereof a distance such that when the part rests on said edge it supports a brush engaged within the opening with its back spaced from the surface on which the part rests, a curved top edge which is symmetrical with respect to the opening and is spaced from the center thereof a distance such that when the part is placed down on said edge it will support the bristles of the brush above the surface while rolling over to one side or the other and straight side edges at distances from the center



such that when the part rolls over onto one side or the other the corresponding side of the head of the brush will be held spaced from the surface on which the part rests, said part being comprised of elastic material and being split axially along one side to enable enlarging the opening for receiving handles of different cross section.

3,968,951

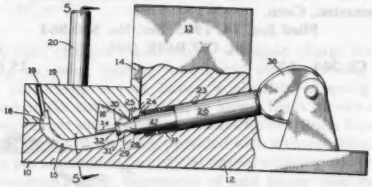
METHOD AND APPARATUS FOR MOLDING AN ELASTOMERIC FISHING LURE BODY

Jack R. Zeman, P.O. Box 10167, Fort Lauderdale, Fla. 33305

Filed Oct. 9, 1974, Ser. No. 513,480

Int. Cl.² B29F *1/10, 1/022*

U.S. Cl. 249—55 **1 Claim**



1. In an apparatus for molding an elastomeric, weedless fishing lure, said apparatus having first and second confronting dies which, when brought together, define a mold cavity between them, and a plunger reciprocable with respect to said dies at one end of the mold cavity for forming in the mold body a passageway, the improvement wherein:

said first die comprises a fixed base having an upwardly extending standard at one end thereof and a shelf at the other end thereof below said standard, said shelf having a bottom face and an upwardly-facing, concave recess therein that is generally the shape of half an egg;

said second die being reciprocable up and down above said shelf and having a downwardy-facing, concave recess therein that is generally the shape of half an egg, so that when said second die is lowered against said shelf, said concave recesses come together and define an egg-shaped mold cavity between them;

said second die having a narrow, elongated rib projecting downwardly from said downwardly facing, concave recess below said bottom face so that said rib extends into said upwardly-facing recess when said dies are brought together for forming in the molded body a deep, narrow, elongated recess which is open at the side of the molded body formed by said second die;

said rib having a bottom edge and an upstanding side edge facing toward the end of said cavity nearest said standard and spaced therefrom;

said recesses having at said end of said cavity a pair of semi-circular openings which, when brought together,

form a circular opening leading into said cavity opposite said upstanding side edge, said circular opening having an edge;

said base having a bore therein extending from said opening under said standard through said base to the side thereof opposite said cavity;

a plunger reciprocable in said bore with respect to said end of said cavity, substantially in the direction of elongation of said rib, between a retracted position out of said cavity and an extended position abutting said upstanding edge of said rib and substantially aligned with the bottom edge of said rib, for forming in the molded body a passageway leading from the corresponding end of the molded body into the bottom of the recess therein;

said plunger having an inner end in the form of a stem which engages said upstanding edge of said rib in the extended position of the plunger with the dies brought together;

and said plunger having outward along its length beyond said stem an enlargement of larger cross section than said stem engageable with the edge of said circular opening to close the same when said plunger is in the extended position thereof;

said enlargement extending through said opening into said cavity in the extended position of said plunger for forming in the molded body an enlargement in said passageway which is spaced outward along the latter from said recess formed by said rib;

and said enlargement having a reduced neck of smaller cross section than the remainder of said enlargement lying within said cavity in the extended position of said plunger for forming an anchoring projection along said enlargement of the passageway in the molded body;

said enlargement also having a tapered surface at one end of said recess providing the surface which engages the edge of said opening when said dies are brought together and said plunger is in the extended position thereof;

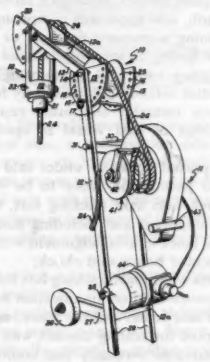
said enlargement further having an inner end opposite said tapered surface with a pair of opposed grooves therein for forming in the molded body projections for preventing rotation thereof on a head inserted in said passageway.

3,968,952

ASSEMBLY FOR PULLING A LINE

E. Strohm Newell, 2350 Sixth Ave., San Diego, Calif. 92101

Filed Aug. 22, 1974, Ser. No. 499,674
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **13 Claims**



1. An assembly for pulling a line comprising:

a. a frame structure having a base frame section and a structural configuration that is adjustable to a plurality of working positions,

b. a power unit mounted on the frame structure, and

c. means for guiding a line from the power unit along the frame structure,

d. a power unit including means for hanging the unit onto the base frame section,

e. said base frame section including a horizontal support member,

f. said power unit hanging means including a bracket member having an open channel shape attached at the line pulling end of the power unit,

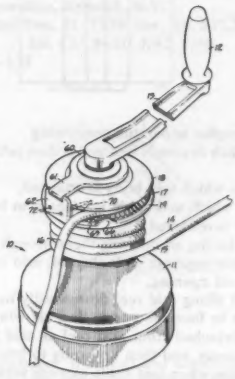
g. said open channel shape of the bracket being effective to hang over the horizontal support member.

3,968,953

SELF-TAILING WINCH

Jesus Guangorena, Atherton, Calif., assignor to Barient Company, San Carlos, Calif.

Filed Jan. 27, 1975, Ser. No. 544,125
Int. Cl.² B66D *1/30*
U.S. Cl. 254—150 R **6 Claims**



2. A self-tailing winch for a rope, including in combination:

a stationary frame,

a rotary input shaft rotatably supported by said frame,

a rotary drum rotatably supported by said frame,

a gear train connecting said rotary input shaft to said rotary drum so that said drum is driven by said shaft,

a facing pair of ring-shaped clamping means operably connected to said drum for rotation therewith and defining a groove between them, at least one of said clamping means having a serrated face for better gripping of a rope in the groove and at least one clamping means being axially movable with respect to the other,

spring means for urging said clamping means toward each other yieldably,

a generally cylindrical member mounted for rotation with said drum adjacent to and interior of the groove defined by said pair of clamping means, providing an inner boundary of said groove to define a constant winding diameter for the rope, said cylindrical member being of diameter substantially equal to the winding diameter of the drum,

a stationary member adjacent to the groove and anchored to said frame,

rope guide means supported by said stationary member for assisting in feeding said rope between said drum and said groove, and

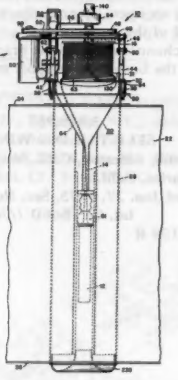
rope stripping means supported by said stationary member for assisting in paying out said rope from said groove and for guiding it out therefrom.

3,968,954

OCEANOGRAPHIC APPARATUS

Ernest L. Casco, and Ralph F. Kosic, both of San Diego, Calif., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed May 17, 1974, Ser. No. 471,085
Int. Cl.² B66D 1/00
U.S. Cl. 254—186 R 18 Claims



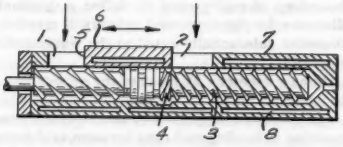
1. Oceanographic apparatus comprising
a. a body which descends into and is then retrieved from the ocean,
b. a cable to which said body is attached,
c. a reel on which said cable is adapted to be wound when said body is retrieved,
d. said reel having an opening therethrough which extends between the opposite ends thereof, said cable extending through said opening,
e. means for tilting said reel downwardly to bring said one end down to face the ocean thus allowing said cable to become detached from said reel as said body descends into the ocean, and then upwardly to bring said one end to a position when said cable extends vertically over said one end, and
f. means for rotating said reel while it is in its upward position to wind said cable thereon and retrieve said body.

3,968,955

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF VULCANIZABLE MIXTURES

Rudolf Paul Fritsch, Goslarer Strasse 58, 7, Stuttgart-Weilimdorf, Germany

Division of Ser. No. 429,069, Dec. 28, 1973, Pat. No. 3,904,719, which is a continuation of Ser. No. 850,168, Aug. 14, 1969, abandoned. This application June 20, 1975, Ser. No. 588,943
Claims priority, application Germany, Aug. 14, 1968, 1779465
Int. Cl.² B29B 1/00
U.S. Cl. 259—192 1 Claim



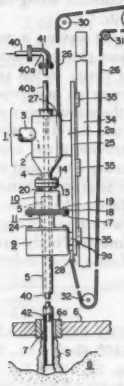
1. A screw extruding apparatus for continuously and controllably proportioning the components of a vulcanizable mixture, said apparatus having a bore, at least one screw shaft located in said bore, a back-pressure device located in said bore, a first inlet located upstream of said back-pressure device, a second inlet located downstream of the back-pressure device, means for controllably adjusting the distance between said back-pressure device and said first inlet which includes, a slide member slidably mounted for movement on said apparatus, said slide member defining, in part, a back-pressure zone in said bore extending between said downstream edge of said first inlet and said back-pressure device, so that said back-pressure zone will have a length that is variable corresponding to sliding movement of said slide member on said apparatus.

3,968,956

LANCING APPARATUS WITH MEANS FOR READY REPLACEMENT OR RENEWAL OF LANCES FOR TOP BLOWN METALLURGICAL FURNACES

Junsuke Sugiura, Iwaki; Junetsu Takahashi, Kagawa; Takeyoshi Shibasaki, and Motoaki Yoneda, both of Iwaki, all of Japan, assignors to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,877
Int. Cl.² C21C 5/32
U.S. Cl. 266—226 5 Claims



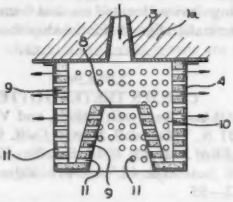
1. An apparatus for blowing air or oxygen under pressure into a metallurgical furnace through a lance inserted therein through its mouth, said apparatus comprising:
a vessel defining a pressure-tight air or oxygen chamber therein and having an inlet conduit and an outlet conduit communicating with said pressure-tight chamber, said outlet conduit extending downwardly from said vessel;
a packing box rotatably supported coaxially under said outlet conduit of said vessel in open communication therewith;
a chuck supported coaxially under said packing box and adapted to permit the lance to be inserted upwardly therethrough into said packing box, said chuck being rotatably supported and including means for releasably holding the lance in axial alignment with the mouth of the furnace located below said chuck;
packing means within said packing box for effectively establishing pressure-tight communication between said outlet conduit of said vessel and the lance, said packing means being adapted for sealing contact with the lance;
a carriage movable vertically and combinedly supporting said vessel, said packing box, and said chuck thereon;
first drive means for imparting up-and-down motion to said vessel, said packing box, and said chuck toward and away from the furnace; and
second drive means for imparting rotation to said packing box and said chuck.

3,968,957

GAS CARBURIZING FURNACE

Takeji Asai, and Kaishu Yamazumi, both of Toyama, Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Sept. 10, 1975, Ser. No. 612,186
Claims priority, application Japan, Apr. 9, 1975, 50-43500
Int. Cl.² C21D 1/74
U.S. Cl. 266—257 5 Claims



1. A gas carburizing furnace having a dropping port to supply liquid organic composition into the interior of said furnace and a vaporizing and catalyzing device, the improvement comprising:

a thermal plate, said plate being directly under said dropping port; and

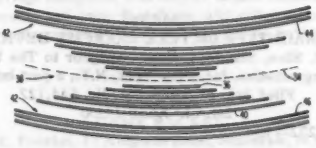
a perforated housing, said housing being integral with and surrounding said thermal plate, said housing further being coupled to the interior of said furnace and together with said thermal plate and the interior of said furnace forms a chamber into which said liquid organic composition is supplied.

3,968,958

COMPOSITE MATERIAL SPRINGS AND MANUFACTURE

Paul V. Huchette, Latrobe, and Homer H. Hall, Jr., Vandergrift, both of Pa., assignors to Edgewater Corporation, Oakmont, Pa.

Division of Ser. No. 310,815, Nov. 30, 1972, Pat. No. 3,900,357, which is a continuation-in-part of Ser. No. 34,117, May 4, 1970, abandoned. This application June 11, 1975, Ser. No. 585,747
Int. Cl.² F16F 1/22
U.S. Cl. 267—47 16 Claims



1. An elongated fiber-reinforced composite spring

having a tension side, a compression side, a neutral axis extending between its longitudinal ends, and a varying cross-sectional area as measured in a plane perpendicular to the neutral axis, with the cross-sectional area diminishing in approaching at least one of the longitudinal ends of the spring providing a tapered configuration, such spring comprising

a neutral axis portion, a centrally located core portion, and a peripheral portion,

the neutral axis portion comprising at least one elongated ply comprising solely non-woven fibers in the side-by-side, longitudinally-oriented, unidirectional relationship extending along the neutral axis between longitudinal ends of such spring,

the centrally located core portion comprising a plurality of varying length plies of solely non-woven fibers, such fibers being in side-by-side, longitudinally-oriented, unidirectional relationship in each ply, such plies being of varying length dimension in the longitudinal direction of such spring and oriented longitudinally in overlying relationship with shorter length plies of the varying-length plies being centrally located contiguous to the neutral axis and plies of progressively increasing length being located outwardly from such neutral axis in the direction of both the tension and compression sides of such spring,

the peripheral portion comprising a plurality of elongated full-length plies comprising solely non-woven fibers, such fibers being in side-by-side, longitudinally-oriented, unidirectional relationship in each ply, with such elongated full-length plies extending between longitudinal ends of such spring in overlying relationship to the neutral axis portion and the centrally located core portion,

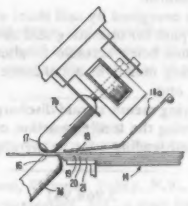
such fibers in the neutral axis portion, centrally located core portion, and peripheral portion being bonded together in a matrix material forming a unitary structure.

3,968,959

DOCUMENT TRANSPORT AND SEPARATING DEVICE

Oliver Duane Johnson, Austin, Tex., and Frederick Fenn Quist, Jr., Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,732
Int. Cl.² B65H 3/42, 3/46
U.S. Cl. 271—137 2 Claims



1. A sheet separator, transport and alignment device capable of feeding, transporting and aligning a single sheet from a stack of sheets responsive to a source of electrical pulses, said device comprising:

means for driving sheets of paper from said stack;

separator restraint means associated with said means for driving for receiving sheets driven thereby;

said separator restraint means comprising a pair of intermittent motion imparting means responsive to said source of electrical pulses including tips being mounted one above the other each having substantially flat ends which are moved in a substantially elliptical path with the upper tip end being rotated in a direction at the lower portion of said ellipse as said tip end is moving in the desired direction of transport of said sheet and in contact therewith and the end of the tip of said other intermittent motion imparting device being rotated in a direction opposite to said desired direction of transport of said sheet at the upper portion of its said ellipse such that the lower portion of the upper tip and the upper portion of the lower tip reach their lower most and upper most positions substantially simultaneously by timewise controlling the application of said electrical pulses; and

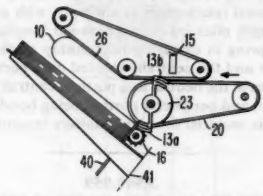
each said intermittent motion imparting means including a solenoid mounted on a frame with its armature being driven in a rectilinear manner in the direction of said paper by said electric pulses being applied to its windings at least one spring for returning said armature in the opposite direction with said spring being mounted on said frame such that the longitudinal motion of the portion of said tip farthest from said paper is converted at the opposite end thereof to said substantially elliptical path.

3,968,960

SHEET INVERTING AND STACKING APPARATUS

John Fedor, and James V. Vetrone, both of Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,510
Int. Cl.[2] B65H 29/40
U.S. Cl. 271—187 4 Claims



1. Apparatus for stacking a sheet conveyed along a path to a discharge region comprising:

a stacking platform for receiving said sheet;

first means for conveying a sheet along a path to said discharge region adjacent said stacking platform;

means at said discharge region operable for deflecting the leading edge of a moving sheet from said path to said stacking platform;

control means energized by said sheet at a designated location in said path for operating said deflection means, said control means being settable to alter the movement of said deflecting means in accordance with the length of said sheets; and

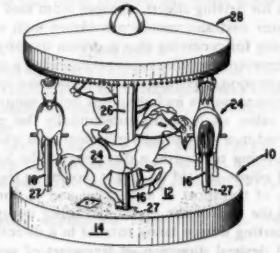
second conveying means at said discharge region for engaging and moving the trailing portion of said sheet beyond said deflected leading edge to thereby invert said sheet.

3,968,961

MERRY-GO-ROUND

Joseph J. Mancusi, Jr., Altair, Inc., 50 Altair Ave., Plymouth, Conn. 06782

Filed Dec. 11, 1974, Ser. No. 531,694
Int. Cl.[2] A63G 1/34
U.S. Cl. 272—44 1 Claim



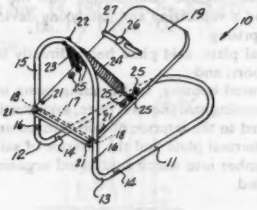
1. A compact and easily assembled merry-go-round comprising a turntable having a generally flat portion terminating in a depending curtain about its periphery, a column mounted on said turntable about its central portion, a canopy mounted on said column for rotation therewith and extending over said turntable, imitation animals carried by said turntable in its direction of rotation but movably disposed for up and down and forward and backward tilting motion by being mounted at the upper ends of straight elements extending from above to below the turntable through apertures therein and rigidly fixed to cam follower elements pivotally connected to the underside of the turntable, a carpet on the upper surface of the generally flat portion of said turntable and closely fitted to said straight elements to close off the space between each straight element and the edge of its aperture, a rigid frame underneath said turntable and inside its depending curtain, a circular track lying underneath said cam follower elements and fixed upon said frame, said circular track having vertical undulations, a turntable driving assembly including an electric motor mounted on said frame and establishing a driving connection with the central portion of the turntable, spaced frictionless rollers mounted on said frame and engaging the underside of the turntable for rotatable support thereof, and adjustable frame leveling devices located on said frame underneath said rollers in vertically aligned relationship therewith.

3,968,962

CHILD'S TEETER TOTTER

Luther C. Atkins; Jimmy G. Atkins, and Vonniebelle Atkins, all of 5207 N. Villa No. 7, Clovis, Calif. 93612

Filed May 15, 1975, Ser. No. 577,677
Int. Cl.[2] A63G 11/00
U.S. Cl. 272—55 5 Claims



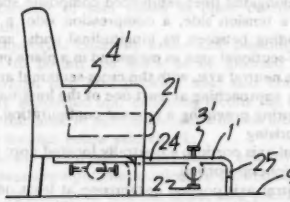
1. A child's teeter totter comprising a generally U-shaped tubular base frame, an inverted generally U-shaped upright frame extending perpendicularly upwardly from said base frame, means connecting the open ends of said U-shaped frames at their juncture, a generally rectangular seat board, means mounting one end of said board in the lower end of said upright frame for pivotal movement about a horizontal axis, a pair of springs connected at one end to the upper end portion of said upright frame, and means selectively adjustably connecting the lower ends of said springs to opposite sides of the upper surface of said seat board.

3,968,963

CHAIR-TYPE BICYCLE EXERCISE DEVICE

Rocco M. Sileo, Stamford, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 27, 1975, Ser. No. 544,122
Int. Cl.[2] A63B 21/00
U.S. Cl. 272—134 1 Claim



1. An exercise device, comprising

a frame having spaced opposite first and second ends;

a chair having a seat having an undersurface and supported a predetermined distance above a supporting surface by legs, guide means of channel configuration affixed to the undersurface of the seat of the chair for slidably accommodating and supporting said frame for movement of said

first and second ends under and for movement of said second end in front of said chair;

bicycle-type pedal means rotatably mounted on the frame intermediate the first and second ends thereof in a manner whereby the pedal means is rotatable by a user seated in said seat in proximity with the frame; and

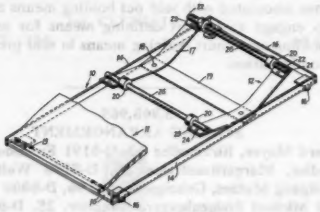
adjustable support means on the second end of the frame for adjustably mounting the second end of the frame relative to said supporting surface with the pedal means a selected distance above the surface whereby the pedal means are positionable relative to the chair by a user seated in the chair and the pedal means are rotatable by the user.

3,968,964

VAULTING BOARD

Richard W. Grosser, Boone, and Virgil L. Long, Jefferson, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Jan. 28, 1975, Ser. No. 544,897
Int. Cl.² A63B *5/08*
U.S. Cl. 272—65 **5 Claims**



1. A vaulting board device comprising a generally rectangular shaped base frame, a generally rectangular shaped board overlying said frame, one end of said board being fixed to one end of said frame and the other end of said board being free with respect to said frame for movement towards and away therefrom, a pair of elongated leaf springs positioned beneath said board, said leaf springs being fixed at their central portions to said frame along opposite sides thereof, opposite ends of said springs being free with respect to said frame for movement towards and away therefrom, and roller means on the ends of said springs in contact with the underside of said board.

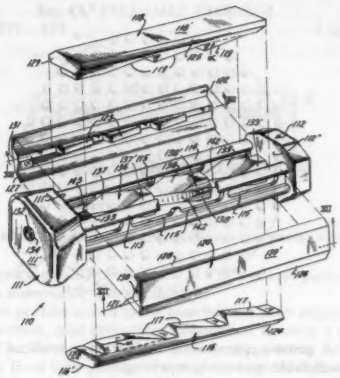
3,968,965

GAME RACKET

Richard E. Frenkel, 17 Kingston Road, Scarsdale, N.Y. 10583, and Allan E. Schwartz, 3 Bristol Place, Yonkers, N.Y. 10710

Continuation-in-part of Ser. No. 341,156, March 14, 1973, Pat. No. 3,833,218. This application Jan. 22, 1974, Ser. No. 435,484
Int. Cl.² A63B *49/08*
U.S. Cl. 273—73 J **7 Claims**

1. A game racket comprising a head, having a surface for contacting a playing ball and a partially hollow handle connected to said head, said handle being formed of a frame having two end pieces and struts extending therebetween defining a grip portion, and a flexible grip surrounding said handle, a rotatable member having a threaded external surface and carried by said handle axially therethrough, radially movable wall plates forming the external structure of said partially hollow portion of said handle and supported by said frame, a cam member carried on said rotatable member within said handle and comprising a plurality of body sections each of which has more than one cam surface inclined at an angle to the longitudinal axis of said handle, each body section being of identical configuration and orientation so that corresponding cam surfaces of each body section lie in parallel planes, each of said cam surfaces being in contact with cooperating



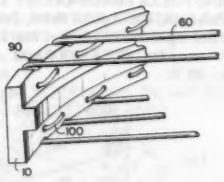
surfaces on said wall plates, and means for rotating said rotatable member so that said cam member will apply pressure to said wall plates for varying the diameter of said grip.

3,968,966

RACQUET WITH TWO INDEPENDENTLY STRUNG FACES

Cesare A. D'Aquanni, Pleasant Valley, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 5, 1975, Ser. No. 574,413
Int. Cl.² A63B *51/06*
U.S. Cl. 273—73 D **6 Claims**



1. A racquet comprising:

a handle;

an elongated metal band bent generally into the form of an ellipse and attached to the handle to form a racquet frame;

string support means on the band; and

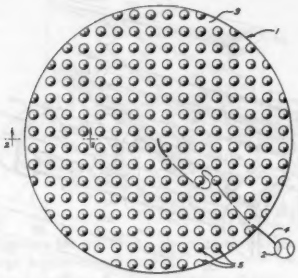
two racquet strings supported by the string support means and wrapped around the elliptical portion of the band to form two parallel faces which are spaced apart from each other, each face having the form of a flat rectangular grid and being strung by a corresponding one of the strings in a manner at which each string forms the longitudinal and transverse runs of its respective face, thus forming two independently strung faces.

3,968,967

SYMMETRICALLY ARRANGED, HEMISPHERICAL BALL REBOUNDING ELEMENTS

Phillip L. Nally, 302 W. Muir, Bardstown, Ky. 40222

Filed Mar. 28, 1975, Ser. No. 563,090
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 A 3 Claims



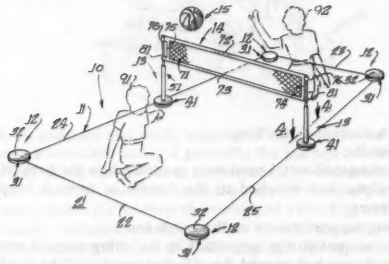
1. A game apparatus for deflecting a resilient ball in an unpredictable manner comprising:
- a body member having a horizontally disposed base and a flat upper surface;
- a tether member attached between said upper surface of said body member and said ball to provide limited movement of said ball relative to said body member;
- a plurality of hemispheric ball-deflecting means projecting from said flat upper surface and arranged in an ordered pattern, the outer surface of each of said deflecting means providing bounce-producing surface means;
- said deflecting means, each being symetrical about a vertical axis and being positioned a distance relative to each other sufficient to cause the surface of said ball when forcibly received against said upper surface to contact at least a portion of one of said bounce-producing surfaces rather than contacting only a flat portion of said upper surface, thereby causing the elastic bouncing of said resilient ball off said bounce-producing surface in an unpredictable manner the length of the tether.

3,968,968

MINI-VOLLEYBALL COURT LAYOUT

Richard C. Peterson, 425 Apollo Drive, Joliet, Ill. 60435

Filed Apr. 28, 1975, Ser. No. 572,144
Int. Cl.² A63B 71/02
U.S. Cl. 273—95 H 5 Claims



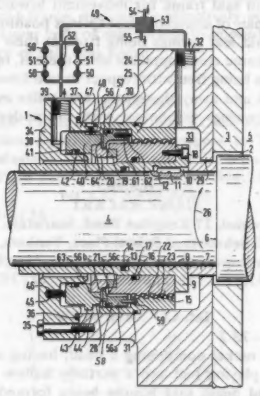
1. A mini-volleyball game apparatus comprising, in combination:
- a playing court defining means consisting of a one-piece unitary length of endless flexible cord to be restingly positioned on the ground and oriented into a rectangular closed loop shape defining a rectangular playing court having opposed parallel spaced apart end lines and opposed parallel spaced apart side lines;
- a set of four identically configured weight members for retaining the corners of the cord of the playing court defining means, each weight member having a flat circular disc-shaped body member, a flat top surface, a flat bottom surface, and cylindrical side wall surfaces;
- an L-shaped slot disposed in the bottom surface of each of said weight members, said slot opening out of the bottom surface to releaseably engage a portion of said cord therein, said slot being of a key-hole cross-sectional configuration having a generally cylindrical top section joined tangentially to the top portion of a truncated triangular section, the distance between the point of intersection between the triangular section and the cylindrical top section being less than the diameter of the cord whereby said cord is forced through the triangular section to be releaseably frictionally engaged in the cylindrical section;
- net means adapted to divide the playing court area in half;
- post means adapted to hold the net means in the desired location;
- a spherical playing ball; and
- means associated with said net holding means and adapted to engage said court defining means for assisting and holding said court defining means in said predetermined configuration.

3,968,969

SEALING ARRANGEMENT

Ehrhard Mayer, Birkenallee 13, D-8191 Eurasburg; Ludwig Findler, Margeritenstrasse 30, D-8190 Wolfratshausen; Wolfgang Mathes, Geiselgasteigstr. 96, D-8000 Munich 90, and Michael Steigenberger, Hauptstr. 25, D-8191 Eurasburg, all of Germany

Filed Feb. 26, 1975, Ser. No. 553,295
Claims priority, application Germany, Mar. 1, 1974, 2409954
Int. Cl.² F16J 15/34
U.S. Cl. 277—15 13 Claims



1. Mechanical seal assembly for an axially extending elongated shaft comprising,
- means defining an annular slide ring seal with rubbing slide ring and counter ring elements,
- means defining a housing containing said seal and rotationally fixedly mounting said slide ring,
- said counter ring being mountable on said shaft via counter ring support structure,
- means defining a coolant circuit that conducts a coolant through the seal housing in an axial direction and includ-

ing a pump device with inlet and outlet ends for pumping coolant liquid through the circuit, which circuit further comprises an annular space surrounding said seal and distributor guiding means that conduct the coolant to an edge of the sealing interface of the slide ring and counter ring within said annular space and which are sealed with respect to the seal housing,

and further comprising means for supporting and displacing the distributor guiding means in said axial direction and constructed and arranged to maintain the distributor guiding means at a constant axial distance from the slide ring,

the slide ring being mounted in the seal housing in a rotationally fixed manner and being axially displaceable against springs.

3,968,970
STUFFING BOX

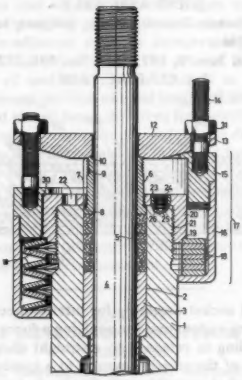
Ernst Vogeli, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,710

Claims priority, application Switzerland, Mar. 5, 1974, 3033/74

Int. Cl.² F16J *15/18*

U.S. Cl. 277—106 **10 Claims**



1. A stuffing box comprising

a housing;

a packing within said housing;

a sleeve mounted coaxially of said packing for movement relative to said housing to apply pressure on said packing;

a yoke abutting said sleeve;

a cap nut threadably mounted on said housing;

an annular carrier;

at least one pressure spring mounted between said cap nut and said carrier and biasing said cap nut and said carrier apart, said spring being mounted in a line of force between said housing and said yoke; and

at least two bolts threadably mounted in said carrier and passing through said yoke for moving said yoke towards said sleeve and said sleeve against said packing in opposition to the biasing force of said spring.

3,968,971
FLUID-TIGHT PACKING

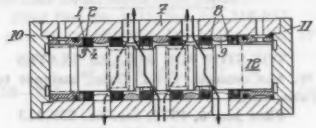
Claude Marinulle, Le Palais-sur-Vienne, France, assignor to Automatisation - Sogemo, Saint-Junien, France

Continuation of Ser. No. 469,850, May 14, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,395

Claims priority, application France, May 22, 1973, 73.18504

Int. Cl.² F16J *15/32*; F16R *3/02*

U.S. Cl. 277—177 **7 Claims**



1. A fluid-tight packing for relatively moving parts, comprising:

a base portion fixedly connected to a first of said parts so as to be immovable relative thereto,

an active portion united to the base portion at an articulated connection, said articulated connection forming a pivot point for turning movement of the active portion relative to the fixed base portion over a given angular distance to a limit angular position in the direction of relative movement of said parts,

the surface of the active portion on the side thereof opposite its articulated connection with the base portion sealingly engaging the second of the relatively moving parts, said surface of the active portion being part-circular in its natural uncompressed state, as viewed transversely to the direction of relative movement of the parts, with the center of curvature of the part-circular surface being located at the location of the said articulated connection so that as the active part turns about its said center of curvature to change its zone of contact with the second part, thereby enabling normal lubrication to tend to be re-established, the said surface of the active part rolls in the circle of which it is a part, and wherein the said part-circular surface extends circumferentially a sufficient distance to remain in sealing contact with the second part when the active portion has turned to said limit angular position.

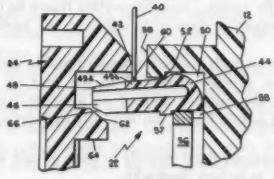
3,968,972
SELF CENTERING HUB FOR FLEXIBLE RECORDING DISCS AND THE LIKE

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed June 21, 1974, Ser. No. 481,523

Int. Cl.² B23B *31/18*

U.S. Cl. 279—2 R **31 Claims**



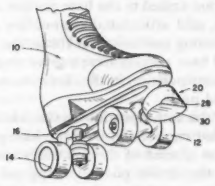
1. A self-centering hub construction for mounting a disc in centered position thereupon, comprising in combination: a rotatable hub member and means for driving the same, said hub including a surface for receiving part of said disc in

clamped relation thereagainst; a plurality of centering finger portions and means movably mounting said portions on said hub member, for movement at least toward and away from the axis of said hub member; a clamping means movable generally toward and away from said hub member and having a first surface for engaging said disc and clamping it against said surface of said hub member; and means for moving said centering finger portions outwardly and away relative to the axis of said hub member and the center of said disc, contacting at least a portion of an aperture in said disc and moving the latter relative to said axis and thereby centering it upon such axis.

3,968,973
TOE STOP FOR ROLLER SKATES

Darrell W. McCormack, Tulsa, Okla., assignor to Fo-Mac, Inc., Tulsa, Okla.

Filed Jan. 6, 1975, Ser. No. 539,023
Int. Cl.² A63C *17/14*
U.S. Cl. 280—11.2 **2 Claims**



1. A toe stop for roller skates comprising a main body portion having a bottom surface including two flat surfaces disposed at angles with respect to each other, one of said flat surfaces having a lesser exposed surface area than the other of said flat surfaces, and means carried by the main body portion for securing the toe stop to the roller skate with a lesser flat surface being orientated forwardly on the skate, and wherein the outer periphery of the main body portion is substantially arcuate but having a relatively short straight chord portion intersecting the arcuate periphery at the forward portion of the toe stop conterminous with the lesser flat surface.

3,968,974
BRAKEABLE HAND TRUCK

Nelson Wetzel, Rte. 2, Box 100, Hillsboro, Oreg. 97123

Filed Feb. 21, 1975, Ser. No. 551,725
Int. Cl.² B62B *5/04*
U.S. Cl. 280—47.27 **7 Claims**

1. A brakeable hand truck comprising, in combination:

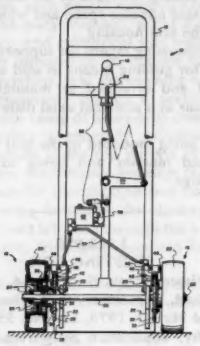
a. a generally upright, load-supporting frame having a lifting blade projecting forwardly adjacent the bottom of said frame;

b. a pair of laterally spaced wheels rotatable independently from one another mounted to the rear of said frame adjacent the bottom thereof on a single common axle attached to said frame, for movably supporting said hand truck;

c. a disc coaxially fixed directly to each of said wheels so as to rotate in unison therewith;

d. a pair of calipers fixedly attached to said frame respectively on each side thereof, each caliper having two spaced finger members disposed respectively on each side of a respective disc for forcibly pinching said disc therebetween;

e. bearings mounting said wheels on said axle, said bearings permitting said wheels to move laterally on said axle with respect to said frame; and

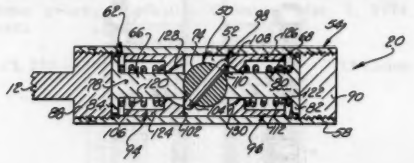


f. actuator means connected to said calipers for causing said finger members to pinch said respective disc.

3,968,975
JOINT ASSEMBLY

Edward J. Herbenar, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed June 9, 1975, Ser. No. 585,252
Int. Cl.² F16C *11/06*
U.S. Cl. 280—95 R **18 Claims**



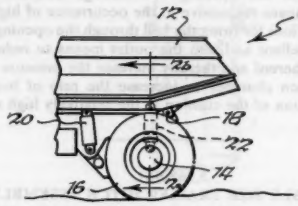
1. A ball and socket assembly for interconnecting parts of a vehicle steering system and for applying a force to the steering system tending to return it to a straight ahead condition upon actuation of the steering system to a turning condition, said ball and socket assembly including socket wall means for defining a socket chamber and adapted to be connected with a first part of the steering system, ball means disposed within said socket chamber and having an outer surface defining at least a portion of a sphere, shank means connected with said ball means and extending out of said socket chamber, said shank means having an outer end portion which is adapted to be connected with a second part of the steering system, ball seat means fixedly connected with said socket wall means and engaging opposite side portions of the spherical outer surface of said ball means for continuously retaining said ball means in said socket chamber with the center of said ball means in a predetermined position while enabling said ball means to rotate relative to said socket wall means about a central axis of said shank means from an initial position to an actuated position upon actuation of the steering system from the straight ahead condition to the turning condition, and biasing means for applying a force to said ball means tending to rotate said ball means relative to said socket wall means about the central axis of said shank means from the actuated position toward the initial position to thereby apply a force to the steering system tending to urge the steering system from the turning condition toward the straight ahead condition.

3,968,976

DUAL RATE LIQUID SUSPENSION STRUT

Ward Sievenpiper, Alden, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Filed Jan. 10, 1975, Ser. No. 540,006
Int. Cl.² B60G 11/28
U.S. Cl. 280—709 13 Claims



1. A composite suspension strut adapted for connection to vehicles experiencing a side range of loading conditions, said composite suspension strut comprising:

first and second cylinder means, each of said first and second cylinder means having a compressible hydraulic fluid sealed therein and said cylinder means being axially aligned one to another,

first and second displacement rod means, said first and second displacement rod means having end portions concentrically disposed within the non-adjacent ends of said first and second cylinder means respectively and being reciprocably slidable in a sealed manner through said non-adjacent ends to compressibly displace said hydraulic fluid therein and the ratio of the total internal volume of said first cylinder means to the volumetric displacement per unit of axial length of said first displacement rod means being different from each corresponding ratio of said second cylinder and second displacement rod means so that the combination of said first displacement rod and first cylinder means forms a first liquid spring having a first spring constant and the combination of said second displacement rod means and second cylinder means forms a second liquid spring having a second spring constant, the latter spring constant being different from said first spring constant.

3,968,977

TILTABLE INDICIA CONSTRUCTED AS RADIATOR EMBLEM

Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 13, 1974, Ser. No. 523,416
Claims priority, application Germany, Nov. 14, 1973, 2356761
Int. Cl.² B60R 13/04
U.S. Cl. 280—727 10 Claims

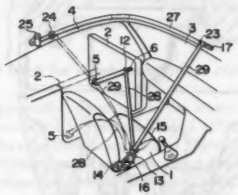
1. A company sign constructed as radiator figure which is adapted to be recessed and operable to be tilted over by a force of predetermined magnitude and which projects beyond the body of a motor vehicle, characterized in that the radiator figure includes a base means mounted within a recess provided in the engine hood and carrying a joint means which enables a tilting over of the radiator figure into the recess in such a manner that neither parts of the radiator figure nor of the base means project beyond the edges of the recess.

3,968,978

AUTOMATIC SAFETY BELT APPARATUS FOR RESTRAINING THE OCCUPANT SITTING ON THE SEAT OF A VEHICLE

Yoshihiro Hayashi, Toyota, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Dec. 20, 1971, Ser. No. 210,033
Claims priority, application Japan, Dec. 18, 1970, 45-114631
Int. Cl.² B60R 21/02
U.S. Cl. 280—745 21 Claims



1. An automatic safety belt apparatus for restraining the occupant sitting on a seat within a vehicle body having at least one door hingedly supported by the vehicle body for selectively opening and closing the doorway from the outside of the vehicle body toward the seat, which comprises;

a. a flexible belt of suitable width having first and second ends, said first end of said belt being connected with the door,

b. automatic winding means rigidly connected with said second end of said belt for forcibly winding up said belt thereby holding said belt under tension,

c. stationary holding means comprising a holding member for holding a first substantially intermediate portion of said belt, and a buckle detachably engageable with said holding member and rigidly connected with a portion of the vehicle body, thereby permitting a first length of said belt between said first end and said first substantially intermediate portion of said belt to extend over the hip portion of the occupant for restraining the same when the occupant is sitting on the seat within the vehicle body with the door closed,

d. movable holding means for holding a second substantially intermediate portion of said belt between said stationary holding means and said second end thereby providing a second length of said belt adaptable for restraining the shoulder portion of the occupant on the seat, said movable holding means being movable between releasing and fastening positions, said releasing position being located substantially obliquely, upwardly and forward of the occupant on the seat and said fastening position being substantially above the door and obliquely, upwardly, behind the occupant on the seat,

e. motor means for effectuating the movement of said movable holding means between said releasing and fastening positions whereby, when said movable holding means is in said releasing position, said second length of said belt extends substantially obliquely, upwardly from said stationary holding means on one side of the hip portion of the occupant remote from the door and forwardly of the occupant and, when said movable holding means is in said fastening position, said second length of said belt extends obliquely from said stationary holding means across the chest portion and over the shoulder portion of the occupant on the other side of said occupant to fasten said chest portion and said shoulder portion, and

f. guide means fixedly extending substantially above the occupant on the seat for guiding the movement of said movable holding means and providing said releasing and fastening positions for said movable holding means.

3,968,979

SAFETY STEERING FOR MOTOR VEHICLE

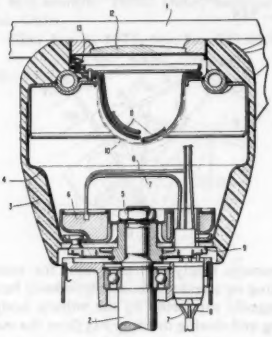
Gerhard Schiesterl, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed July 9, 1971, Ser. No. 161,102

Claims priority, application Germany, July 9, 1970, 2034008

Int. Cl.² B60R *21/08*

U.S. Cl. 280—731 **29 Claims**



1. A safety steering for motor vehicles with a plastically deformable deformation member arranged between a steering wheel and the upper end of a steering spindle, characterized in that a gas cushion means automatically inflatable upon exceeding a predetermined deceleration of the vehicle is arranged on the inside of the deformation member.

3,968,980

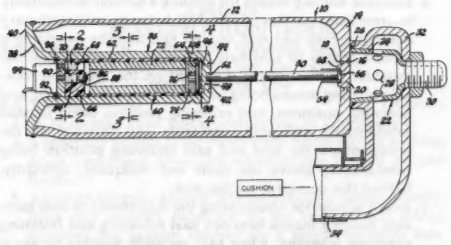
OCCUPANT RESTRAINT SYSTEM

Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1973, Ser. No. 331,663

Int. Cl.² B60R *21/10*

U.S. Cl. 280—734 **4 Claims**



1. In combination with a vehicle subject to low level impact conditions and high level impact conditions and including an inflatable occupant restraint cushion, inflating means for inflating the cushion at a relatively high rate under high level impact conditions and at a relatively low rate under low level impact conditions comprising, a combustion chamber containing a mass of propellant having an opening therethrough and capable of producing pressure fluid by burning and having a burn rate responsive to the pressure within the chamber, outlet means of predetermined orifice area controlling the rate of flow of the pressure fluid from the chamber to control the pressure within the chamber and the rate of burning, means communicating the outlet means with the cushion, the outlet means normally setting a rate of flow of pressure fluid to the cushion to inflate the cushion at the relatively low rate, a ball, means mounting the ball within the combustion chamber to one side of the mass of propellant and in general spaced alignment with the opening therethrough and the outlet means, and means responsive to the occurrence of high level impact conditions for firing the ball through the opening in the mass of propellant and into the outlet means to reduce the orifice area thereof and thereby increase the pressure within the combustion chamber to increase the rate of burn and provide inflation of the cushion at the relatively high rate.

3,968,981

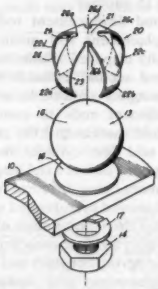
VARIABLE SIZE TRAILER HITCH ASSEMBLY

Roderick A. Suarez, P.O. Box 11, Forest Park, Ga. 30050

Filed Aug. 28, 1975, Ser. No. 608,668

Int. Cl.² B60D *1/06*

U.S. Cl. 280—511 **8 Claims**



1. An adaptor for being received over the ball of a trailer hitch for increasing the effective diameter of the spherical surface of the ball, comprising a hub and a plurality of fingers radiating from said hub, said fingers each being arcuate so as to conform to and be received on the outer surface of the spherical ball.

3,968,982

COAXIAL METALLURGICAL CONNECTION

Martin Belicic, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,248

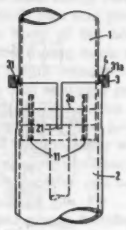
Claims priority, application Germany, Sept. 19, 1973, 2347203

Int. Cl.² F16L *13/00*

U.S. Cl. 285—287 **1 Claim**

1. A joint comprising an inner part and an outer tubular part telescoped over said inner part and joined therewith by solidified molten metal, said parts having differing thermal expansion coefficients, both of said parts being tubes and each having a plurality of slots extending from their respective ends

and parallel to their longitudinal axis and circumferentially interspaced with the slots of one part positioned centrally



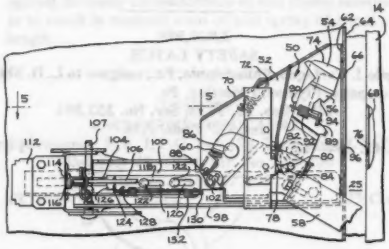
between the slots of the other part and covered by said other parts.

3,968,983

TWO POSITION, THREE FUNCTION LATCHING MECHANISM

Henry J. Heit, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed July 2, 1975, Ser. No. 592,546
Int. Cl.² E05C *3/34*
U.S. Cl. 292—201 **7 Claims**



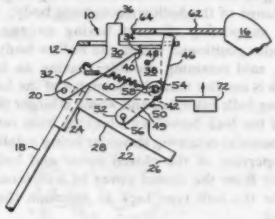
1. A two position three function sliding latch mechanism comprising a base, a latch handle pivotally connected to the base, a latching bolt pivotally connected to the base and joined to both the latch handle and the base by lost motion means whereby movement of the latch handle toward and away from a first unlatched position causes a turning action of the latching bolt, and a locking bar pivotally connected to the latch handle and movable in response thereto, lock means associated with the locking bar for engaging the locking bar and holding the latching mechanism against further movement when the latch handle is in its second latched and locked position, and operating means for controlling the lock means so the handle lever may be shifted toward the first unlatched position, and shutter means associated with the locking bar for supporting the lock means and keeping the lock means from engaging the locking bar in a second latched but unlocked position, said shutter means being set into a cocked position by the lock means when the latch handle is moved from the first unlatched position into the second latched but unlocked position, whereby when the lock means is shifted by the operating means the shutter is released causing it to trip and move away from the lock means so the lock means may engage the locking bar as in the second latched and locked position.

3,968,984

DOOR LATCH

Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 14, 1975, Ser. No. 567,934
Int. Cl.² E05C *3/02*
U.S. Cl. 292—229 **3 Claims**



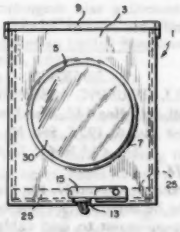
1. A door latch for a dishwasher door comprising:
a frame;
a handle pivotally connected to the frame;
a lever connected to the handle and extending therefrom;
a detent having first, second, and third end portions, said detent being pivotally connected to the frame at the first end portion for pivotal movement between engaged and disengaged positions;
a keeper having first and second end sections and a midsection, said keeper being pivotally connected to the frame at its midsection for pivotal movement between an unlatched position at which the detent engages said keeper and a latched position at which said keeper is spaced from said detent;
toggle linkage means pivotally connecting the second section of said keeper to the lever for pivotal movement of said keeper in response to movement of said lever between extended and retracted positions;
biasing means for urging said detent toward its engaged position when the dishwasher door is open and additionally biasing said toggle linkage means in an over-center relationship when the door is in its closed position;
striker means for causing said detent to move toward its disengaged position in response to closing the door; and
means for contacting the lever and moving it in a direction away from the keeper, thereby causing said keeper to move from its latched position toward its unlatched position.

3,968,985

LOCKS FOR ELECTRIC METER BOXES

Anker J. Nielsen, Jr., 410 Bailey Road, R.F.D. 114, Holden, Mass. 01520, and Lynn H. Morse, Box 1505, W. Venice Ave., Venice, Fla. 33595

Filed Apr. 9, 1975, Ser. No. 566,181
Int. Cl.² E05B *15/02*
U.S. Cl. 292—340 **9 Claims**



1. A locking adaptor assembly for securing the flat apertured cover firmly against a flange of the hollow body of a

receptacle for a wattmeter or the like by use of a completely removable bolt type lock having a cylindrical barrel with locking balls extending laterally near one end of the barrel and with an enlarged head permanently fixed at the other end of the barrel, said locking adaptor assembly comprising:

a. a supporting element detachably mounted within the hollow body of the receptacle, said supporting element having at least one resilient mounting finger for gripping the flange of the hollow receptacle body;

b. said supporting element having an annular retaining shoulder positioned within the hollow body of the receptacle, said retaining shoulder having an inner diameter which is smaller than the diameter of the lock barrel with locking balls extended and which is larger than the diameter of the lock barrel with locking balls retracted; and

c. said annular retaining shoulder being axially aligned with the aperture of the closed cover and being spaced inwardly from the closed cover by a distance sufficient to enable the bolt type lock to maintain the cover firmly closed.

3,968,986

ELECTROMAGNETIC LIFTING DEVICE

Toshio Nagata, Tokyo, Japan, assignor to Kohan Sendan Kikai Kabushikikaisha, Japan

Filed July 25, 1975, Ser. No. 599,150

Claims priority, application Japan, Aug. 8, 1974, 49-94079[U]; Oct. 7, 1974, 49-120268[U]

Int. Cl.² B66C 1/06

U.S. Cl. 294—65.5 **11 Claims**

1. An electromagnetic lifting device for handling ferromagnetic material comprising:

a magnetic pole assembly consisting of a plurality of magnetic pole members disposed in side-by-side relation to each other, said magnetic pole members each having a pair of opposing yokes;

a first magnet-exciting coil surrounding said yokes on one side and a second-magnet exciting coil surrounding said yokes on the other side, of said magnetic pole members, said first and second coils being incorporated in said magnetic pole assembly; and

means for connecting said magnetic pole members in a relatively movable relation to each other.

3,968,987

BELL HOUSING ASSEMBLY UNIT

Harvey E. Powell, P.O. Box 142, Blue Mountain, Miss. 38610

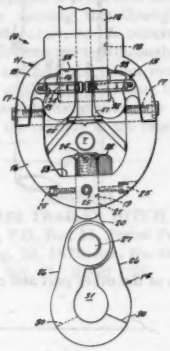
Filed Jan. 6, 1975, Ser. No. 538,590

Int. Cl.² B66C 1/14

U.S. Cl. 294—78 R **4 Claims**

1. In a bell housing assembly, the combination of a swing ring assembly to be fitted on a cable or rope, a securement band unit for securement to said cable or rope and a claw hook unit supported on said swing ring assembly;

said swing ring assembly comprising an upper U-shaped member and a lower U-shaped member pivotally attached together by axially aligned bolts through opposite ends of said U-shaped members, a vertical opening on said upper member for receiving said cable or rope and a vertical opening in said lower member for receiving said claw hook unit;



said claw hook unit comprising an eye bolt having a shank received through said vertical opening of said lower member and fitted with a nut and a pair of claw hook members pivotally depending on a transverse pin received through an eye of said eye bolt; and

said securement band comprising a sleeve, a circular contraction band and a wedge band.

3,968,988

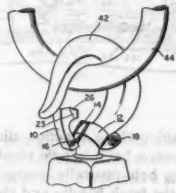
SAFETY LATCH

Angelo J. Carfagno, Philadelphia, Pa., assignor to L. H. Shingle Company, Plymouth Meeting, Pa.

Filed Feb. 15, 1973, Ser. No. 332,891

Int. Cl.² B66C 1/36

U.S. Cl. 294—82 R **1 Claim**



1. A safety latch for industrial load hooks comprising:

a latch member comprising a body portion having a pivot end and a hook-engaging end, with finger lugs being carried by said body portion on opposite sides thereof and each projecting away from said body portion, said finger lugs having edges disposed most remote from said pivot end of said body portion that define a substantially obtuse included angle therebetween;

and a deeply indented positioning dimple in the center of the bottom outer surface of said latch member, said dimple comprising means facilitating secured seating of said latch member against lateral movement relative to a load hook surface;

a clamp member, said clamp member being of a one-piece sheet metal construction and comprising a ring portion and a shank portion, said shank portion being integral with said ring portion and said shank portion terminating in a hinge portion having its centerline positioned inboard

of the inner circumference of the ring portion of said clamp member, said hinge portion terminating in a loop portion curling inboard, wherein said shank portion is inclined outwardly away from said inner circumference of said ring portion of said clamp member at an angle of approximately 5°, such that said pivot end of said latch member clears the body of the hook when said latch member is depressed during hook removal, said shank portion being of a length relative to the length of said latch member such that said ring portion of said clamp member is at a position on the hook no farther interiorly from the throat opening of the hook than said hook-engaging end of said latch member when said latch member is in a hook-engaging position, whereby said ring portion of said clamp member can be positioned close to the throat opening;

means for securing said clamp member to the hook, said securing means comprising a bolt and nut, said bolt passing through respective holes in opposite ends of said ring portion of said clamp member at a point on the hook behind and opposite said shank portion of said clamp member, said opposite ends being in bent relation out of the plane of the ring of said ring portion so as to enable said safety latch to be positioned closer to the throat opening;

means facilitating relative pivoting between said latch member and said clamp member comprising a bolt passing through said loop portion of said hinge portion of said shank portion of said clamp member and the pivot end of said latch member;

and a spring wrapped about said pivoting means having its ends supported against the inner surface of said latch member, said ends terminating at a point no farther than two-thirds of the distance from said pivot end to said hook-engaging end and its middle portion supported against the outer circumference of said clamp member, so as to result in moment arms of said spring of about equal length.

3,968,989

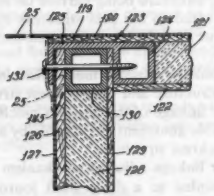
ENCLOSURE STRUCTURE

Ronald Schippers, R.R. 1, P.O. Box 155, Thomson, Ill. 61285

Filed July 18, 1974, Ser. No. 489,499

Int. Cl.² B62D *27/00*

U.S. Cl. 296—29 **33 Claims**



25. An enclosure structure comprising side wall panels and end wall panels affixed thereto and top and bottom panels, said top and bottom panels comprising a plurality of frame members and means forming inner and outer panel surfaces affixed thereto, the frame members at the lateral edges of said top and bottom comprising elongate tubular members and flange members affixed thereto underlying the outer panel surface and cooperating to define a channel, the upper and lower edges of said side wall panels being engaged in said channels and affixed thereto.

3,968,990

DENTAL PATIENT'S CHAIR INCLUDING PADDED BACKREST

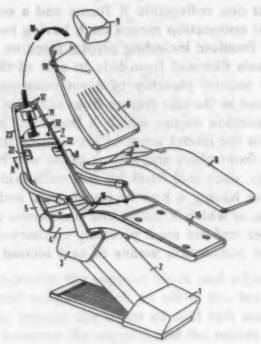
Erich Heubeck, Bensheim/Zell, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Aug. 7, 1974, Ser. No. 496,015

Claims priority, application Germany, Aug. 10, 1973, 2340605

Int. Cl.² A47C *7/02*

U.S. Cl. 297—452 **3 Claims**



1. In a dental patient's chair including a seat and a backrest forming an upper patient-supporting surface; and a padding cover being supported on the upper patient-supporting surface of said backrest, the improvement comprising; said upper patient-supporting backrest including a generally flat, plate-like rigid support frame extending over essentially the major surface area of said backrest and having upstanding side walls extending along the edges thereof; means for detachably fastening said padding cover to said support frame; a shaped element being fastened to said support frame on the side of said frame opposite to that supporting said padding cover; and a rigid form-defining support element being embedded in said shaped element, said shaped element being a shell-like shaped component encompassing the rear surface and having portions cupping the side walls of said support frame, said shaped element being resiliently elastic in planes extending perpendicular to the plane of said backrest and having an exterior washable surface, said padding cover covering the entire front surface of said backrest and extending out so as to contact the portions of the shaped element cupping the upstanding side walls of said support frame whereby the frame is covered in its entirety.

3,968,991

COLLAPSIBLE SEAT STRUCTURES

Owen Finlay Maclaren, Barby, near Rugby, England, assignor to Gannet Holdings Limited, Guernsey, Guernsey (Channel Is.)

Filed Oct. 25, 1973, Ser. No. 409,590

Claims priority, application United Kingdom, Nov. 1, 1972, 50331/72; Mar. 2, 1973, 10246/73

Int. Cl.² A47C *4/28*

U.S. Cl. 297—45 **16 Claims**

1. A volume frame foldable in two dimensions mutually at right angles, comprising, when extended,

a pair of opposite sides of corresponding form, each such side comprising elongate elements and a first plurality of pivot connection means, the elements of each such side including at least an upright front leg, an element which is an upright back leg, and a rigid element which joins the front leg to the back leg through said pivot connection means, said pivot connection means being a pair spaced along said rigid element and disposed at two corners of a

theoretical quadrilateral of which said front leg and said back leg are opposite sides, each pivot connection means of said pair affording a horizontal axis directed from side to side of the volume frame, thereby enabling folding of the frame in one of said dimensions by pivoting of each said front leg about one horizontal axis and pivoting of each said back leg about another horizontal axis in the back to front sense of the frame with concurrent mutual approach of said front leg, said back leg and said rigid element in each said side frame,

the frame further comprising:

at least one collapsible X frame and a second plurality of pivot connection means each having two degrees of pivotal freedom including pivotal freedom about a horizontal axis directed from side to side of the volume frame, said second plurality of pivot connection means being spaced in the side frames from said first plurality of pivot connection means, which X frame lies in a plane extending in the lateral sense of the volume frame and inclined to a front plane and a back plane which contain, respectively, each said front leg and each said back leg, said X frame having a pair of lower ends and a pair of upper ends, of which X frame one such lower end and one such upper end are each pivotally connected by a respective pivot connection means of said second plurality thereof to one of said opposite sides of the volume frame whereas the other such lower end and the other such upper end are each pivotally connected by a respective pivot connection means of said second plurality thereof to the other of said opposite sides of the volume frame, thereby enabling folding of the frame in the other of said dimensions by collapse of said X frame; and

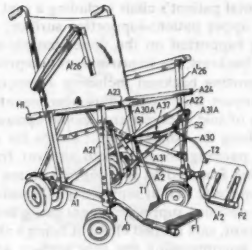
at least one tie means having two ends of limited separability by which ends said tie means are connected in the volume frame in triangulating relationship with said X frame for supporting the volume frame when extended.

5. A volume frame as claimed in claim 1 in which each of said opposite sides comprises four elongate elements joined serially by said first plurality of pivot connection means to form a closed quadrilateral space frame including the front leg, the back leg, the said rigid element and a second rigid element extending generally parallel to, but spaced from, said rigid element.

6. A volume frame as claimed in claim 5 in which ground wheels are mounted thereon and adapt the volume frame for use as the frame of a wheel chair, a fabric seat extends between said pair of opposite sides and is attached thereto,

each said back leg has an upward extension, and

a fabric back support extends between each said upward extension and is attached thereto.



3,968,992

FOLD DOWN TABLE FOR AIRCRAFT SEAT

Gerard T. Hogan, Southington, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 20, 1974, Ser. No. 534,992
Int. Cl.[2] A47B 39/00
U.S. Cl. 297—162 16 Claims

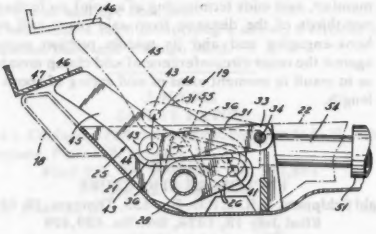
1. In a seat of the type having a seat base and a desk mounted for movement relative to the seat base between a use position overlying the seat and a storage position beside the seat, the improvement comprising a pivot arm mounted for pivotal movement relative to the seat base in a generally vertical plane which is parallel to one side of the seat, said desk being pivotally mounted to said pivot arm for movement between an upper generally horizontal use position wherein said desk overlies said seat and a vertical position wherein said desk is movable with said pivot arm in said generally vertical plane to a storage position beside said seat, and complementary fastening means on said desk and on said pivoted arm for permitting quick removal of said desk from said arm, said desk including means for retaining papers.

3,968,993

VEHICLE SEAT ASSEMBLY

Timothy K. Doyle, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1975, Ser. No. 580,073
Int. Cl.[2] A47C 1/024; B60N 1/06
U.S. Cl. 297—355 2 Claims



1. A vehicle seat assembly comprising:

a substantially horizontal seat structure and a normally upright backrest structure,

the backrest structure being carried on support arms pivotally connected to the seat structure for swinging movement about a single fixed pivot axis extending laterally of the latter,

a four-bar linkage adjuster mechanism interposed between the seat structure and the backrest structure,

the four-bar linkage of the adjuster mechanism terminating in a movable abutment engageable by an abutting portion of the backrest structure,

the four-bar linkage adjuster mechanism comprising a first crank coupled to a drive shaft journalled on the seat structure for rotation about a fixed pivot axis paralleling the backrest structure,

the drive shaft being coupled by a second crank to the brake means,

a follower link having one end pivotally coupled to the seat structure for movement about a pivot axis paralleling the drive shaft pivot axis,

and a connecting rod extending from the first crank to the other end of the follower link,

the abutment being located on the distal end of an extension of the connecting rod,

the abutment being movable under control of the linkage in a path substantially complementary to that taken by the abutting portion of the backrest when the latter is swung

rearwardly from its normal upright position to a predetermined rearwardly reclined position,

and releasable brake means holding the four-bar linkage and thereby the abutment against movement to block rearward inclination of the backrest structure,

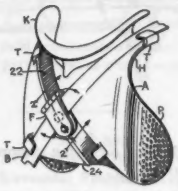
the backrest being forwardly swingable relative to the seat structure from any position independently of engagement with the adjuster mechanism.

3,968,994

AUXILLIARY BODY RESTRAINING DEVICE

John J. Chika, 1350 Orchard Ridge Road, Bloomfield Hills, Mich. 48013

Filed Oct. 24, 1972, Ser. No. 300,314
Int. Cl.² A62B *35/00*
U.S. Cl. 297—390 **45 Claims**



1. An auxiliary body restraining device to provide additional protection and restraint for the head and the upper torso of an occupant of a transportation vehicle seat which is equipped with any type of a lap-belt and shoulder-belt body restraining system, the device comprising in combination:

an auxiliary protective guard for the seat occupant's thorax, head and neck, said guard being easily attachable and detachable to and from the upper section of the existing restraining system crossing the front of the seat occupant's chest;

said guard comprising a relatively thin, rigid, panel-like chest-shield portion which is adjustably positionable substantially transversely and vertically in front of and immediately adjacent to the seat occupant's chest by inserting it underneath and securing it to said upper section of said restraining system crossing his chest, so that the chest-shield will absorb and distribute the impact force of said restraining system over greater area of said occupant's thorax whenever he is being restrained by it;

the upper portion of said chest-shield configured to fit under said occupant's chin and partially around his neck to form a unique head-guard element to limit unwanted movement of the occupant's head and to protect the occupant's head from severe whiplash and other injuries caused by said upper section of said system coming into direct and violent contact with said occupant's head, neck and face while he is being restrained by said upper portion of said chest-shield during any severe deceleration of said vehicle.

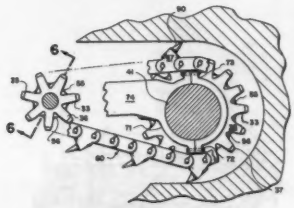
3,968,995

CONTINUOUS MINING MACHINE WITH A CHAIN DRIVE FOR THE CUTTING HEAD

Einar M. Arentzen, Charleroi, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 8, 1974, Ser. No. 431,625
Int. Cl.² E21C *25/52, 25/36*
U.S. Cl. 299—76 **2 Claims**

1. In a continuous mining machine having a frame mounted for movement toward a mine face, a mining head supported forward of the frame and supporting a rotatable cutter drum on an axis extending transverse to the direction of movement of the frame, rotary power means mounted on the frame, a drive sprocket connected to the power means, a driven sprocket connected to the cutter drum, and a cutter chain connecting said sprockets to transmit power from the power means to the cutter drum, the improvement wherein the chain comprises a succession of articulately connected roller chain links having a pair of spaced side bars connected to adjacent links by a pin and a roller rotatably mounted about said pin between the pair of side bars, wherein some of said links include bit support blocks which extend outwardly from said links opposite the sprocket engaging side of said links with



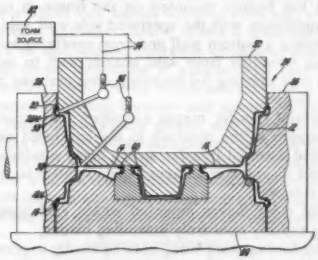
sufficient space between the support block and adjacent rollers and under said support block to allow the teeth of the sprockets to fully engage the roller of said link and further having openings between the support and the rollers effective to allow trapped foreign material such as dirt or coal to escape therebetween as the sprocket teeth squeeze the material against the rollers and support blocks to lessen the build up of foreign matter between the sprockets and the chain; and cutter bits mounted in said support blocks to cut clearance in the mine face for said chains and sprockets.

3,968,996

VEHICLE WHEEL

Raymond J. Wilcox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

Filed Nov. 27, 1974, Ser. No. 527,555
Int. Cl.² B60B *3/06*
U.S. Cl. 301—37 R **11 Claims**



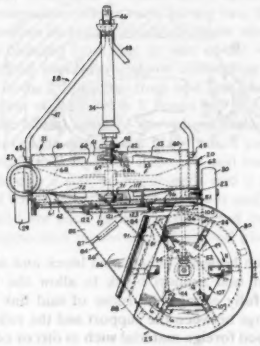
1. A vehicle wheel, comprising: an outer skin including a plurality of members secured to each other to define a cavity, the cavity including an annular rim portion and an interconnected disc portion located within the annular configuration of the rim portion, the rim portion of the cavity projecting axially from the disc portion to the opposite axial sides of the wheel, and foam filling said cavity and engaging and being adhered to the members of said outer skin so as to cooperate therewith as a load bearing and transmitting component of the wheel.

3,968,997

FEED MATERIAL HANDLING APPARATUS

Aquila D. Mast, and Jean Paul Lyet, II, both of Lancaster, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 12, 1970, Ser. No. 2,017
Int. Cl.[2] B65G 53/08
U.S. Cl. 302—37 12 Claims



1. A material conveying apparatus adapted to initially break up heavy clumps of received crop material and then impel the crop material into a blower and subsequently blow the crop material through a transition member to a silo or the like, said apparatus comprising:

a frame;

a blower housing mounted on the frame and including spaced apart vertically extending side walls, a wrapper and a transition member;

a blower fan journalled for rotation within said housing about a generally horizontal axis spaced above an aperture in one of the spaced apart side walls;

an open top hopper mounted on the frame in operative communication with the apertured side wall, said hopper comprising a bottom wall and crop confining means extending upwardly from said bottom wall to define an initial feed opening for receiving crop material dropped in the hopper;

feed material transfer means extending tangentially from said hopper to the aperture in the apertured side wall, said feed material transfer means being a tubular structure and disposed at an acute angle relative to the apertured side wall;

horizontal rotor means mounted within said hopper and having radially outwardly extending blades;

said initial feed opening being open upwardly to permit crop material to be dumped directly onto a substantial portion of said rotor blades under conditions where said rotor is rotated about a vertical axis;

means operable to rotate said rotor means at a speed sufficient to cause clumps of crop material engaged by said rotor means to be broken up and impelled in a generally tangential direction by said rotor means into the blower housing through said apertured side wall via said feed material transfer means, in a generally airborne state; and

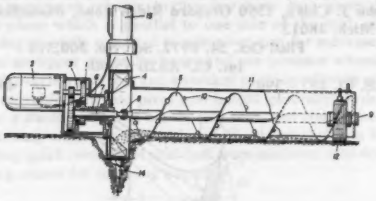
means operable to rotate said blower fan at a speed sufficient to cause crop material impelled into the blower housing to be blown through the transition member to a silo or the like.

3,968,998

TOP UNLOADER FOR SILOS

Johann Wolf, Scharnstein, Austria, assignor to Firma Johann Wolf Gesellschaft m.b.H. KG, Scharnstein, Austria

Filed Dec. 6, 1974, Ser. No. 530,502
Claims priority, application Austria, Jan. 21, 1974, 484/74; Sept. 25, 1974, 7732/74
Int. Cl.[2] B65G 53/48
U.S. Cl. 302—56 8 Claims



1. A top unloader for removing chopped silage from a circular silo, comprising

a frame,

a unit which is carried by said frame and mounted for rotation on a vertical axis at the center of said frame and comprises

a radially extending cutting and feeding screw provided at its periphery with cutting and tearing elements,

an ejecting blower disposed radially inwardly of said screw and comprsing an impeller and an intake opening, which faces said screw and is at least as large in diameter as said screw and exposed throughout its periphery,

drive means for driving said screw and blower, which drive means comprise a hollow shaft, which carries said impeller and is operable to rotate the same, and a drive shaft, which extends through said hollow shaft and is operatively connected to said screw,

said ejecting blower having a diameter which is not more than twice the diameter of said screw,

said drive means being operable to drive said impeller at a speed which is at least four times the speed of said screw,

said drive means comprising a drive motor and a transmission connecting said drive motor to said hollow shaft,

said transmission being contained in a closed transmission housing in which said hollow shaft is cantilever supported,

said screw being surrounded by a casing which is open only on its underside.

3,968,999

METHOD OF MAKING AVAILABLE FUELS FROM ARCTIC ENVIRONMENTS

Leonard J. Keller, Sarasota, Fla., assignor to The Keller Corporation, Dallas, Tex.

Continuation of Ser. No. 405,682, Oct. 11, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,754
Int. Cl.[2] B65G 53/30
U.S. Cl. 302—66 2 Claims

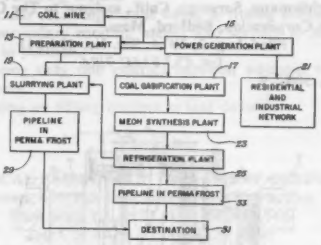
1. A method of making available economical fuel from arctic and subarctic environments without melting the permafrost along a transportation right of way comprising the steps of;

a. preparing a liquid fuel comprising methanol;

b. preparing a solid fuel comprising coal of −200 mesh particle size;

c. forming a cold combustible mixture of said liquid fuel and said solid fuel at a temperature of less than 32°F.; including the steps of admixing and cooling said coal and said

methanol; and



d. pumping the cold combustible mixture through a pipeline in the frozen permafrost at a temperature below 32°F. to a destination.

3,969,000

BRAKE HYDRAULIC PRESSURE CONTROL VALVE

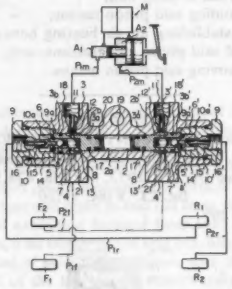
Yoshimoto Ohta, Kawasaki; Yoshihiro Hayashida, Chigasaki, and Haruyuki Amano, Ebina, all of Japan, assignors to Tokico Ltd., Japan

Filed Jan. 30, 1975, Ser. No. 545,699

Claims priority, application Japan, Feb. 5, 1974, 49-14789; Feb. 6, 1974, 49-15222; Nov. 28, 1974, 49-137190

Int. Cl.² B60T 8/26

U.S. Cl. 303—6 C **6 Claims**



1. A brake hydraulic pressure control valve comprising:

a housing;

two separate liquid passages provided in said housing, each said passage having a first end connected to a respective separate source of hydraulic pressure and a second end connected to a respective brake cylinder;

two valve members slidably disposed in said housing, each said valve member having a first end, said first ends opposing each other, and a second end exposed to a respective one of said liquid passages, and each said valve member being provided with valve means for opening and closing said respective one liquid passage; and

a single spring means disposed between said opposed first ends of the valve members acting simultaneously on said two valve members for moving said two valve members away from each other to opened valve positions and for transmitting forces between said two valve members.

3,969,001

CONTROL MECHANISM FOR AUTOMOTIVE VEHICLE HYDRAULIC BRAKING SYSTEM

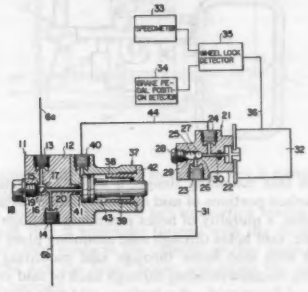
Hiroyuki Nakamura, Toyota; Hiroshi Kawaguchi, and Hideyuki Hayashi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 29, 1974, Ser. No. 501,831

Claims priority, application Japan, Dec. 7, 1973, 48-136234

Int. Cl.² B60T 8/12

U.S. Cl. 303—21 F **4 Claims**



1. In a hydraulic braking system for a vehicle having front and rear wheels, said system including front and rear master cylinder means, front and rear wheel cylinder means, hydraulic braking fluid pressure means and hydraulic brake fluid circuit means for distributing hydraulic fluid pressure in said system, said circuit means including rear brake cylinder circuit means extending between said rear master cylinder means and said rear wheel cylinder means, the combination comprising means for sensing locking of said wheels and for generating a signal indicating the occurrence of wheel lock, a hydraulic brake pressure control device responsive to said wheel lock sensing means adapted to be actuated to a first and a second operative condition, said control device being actuated to said first operative condition to lower wheel cylinder fluid pressure upon receipt from said wheel lock sensing means of the first signal indicating wheel lock occurring while said control device is in said second operative condition, said control device while in said first operative condition being nonresponsive to subsequent wheel lock signals received from said wheel lock sensing means until said control device is subsequently actuated back to said second operative condition, and pressure regulating means connected in parallel with said hydraulic brake pressure control device within said rear brake hydraulic circuit means extending between said master cylinder means and said rear wheel cylinder means, said pressure regulating means being operative while said control device is in said first operative condition to control wheel cylinder fluid pressure in accordance with a predetermined relationship in correspondence with the relationship between braking forces applied to said front and rear wheels after wheel lock has been released.

3,969,002

MOUNTING PLATE FOR SECURING A BRAKE CONTROL VALVE TO A VEHICLE AXLE

Raymond John Jovick, Troy, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

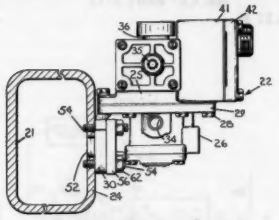
Filed Oct. 9, 1975, Ser. No. 621,221

Int. Cl.² B60T 8/04

U.S. Cl. 303—21 F **11 Claims**

1. A vehicle axle assembly comprising an axle, means for rotatably mounting a ground engaging wheel at each end of said axle, a fluid powered brake mechanism mounted to said axle adjacent each end thereof, each brake mechanism being operative when actuated to restrain rotation of a wheel rotat-

ably mounted at that end of the axle, a relay valve body having a mounting flange formed integral therewith, means providing a source of pressurized fluid to said valve body, conduits connecting said relay valve body to said brake mechanisms at each end of said axle, relay valve means within said body and operable when actuated to supply fluid pressure from said source to said brake mechanism, a plurality of holes extending



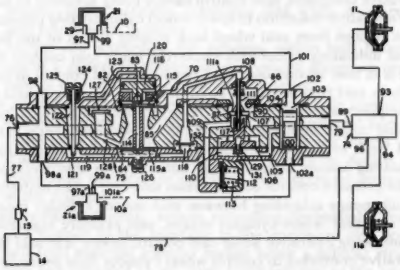
through said mounting flange, a mounting plate contiguous with surface portions of said mounting flange adjacent each of said holes, a plurality of holes extending through said mounting plate, said holes through said mounting plate being axially aligned with said holes through said mounting flange, and fastening means extending through each of said axially aligned holes and fixing said valve body to said axle with said mounting flange secured between said mounting plate and said axle.

3,969,003

ANTI-SKID CONTROL DEVICE AND SYSTEM

Walter H. Morse, South Windsor, and Ira R. Ames, Jr., Salisbury, both of Conn., assignors to The Jacobs Manufacturing Company Limited, West Hartford, Conn.

Division of Ser. No. 431,952, Jan. 9, 1974. This application Apr. 10, 1975, Ser. No. 566,761
Int. Cl.² B60T *8/06*
U.S. Cl. 303—21 F **11 Claims**



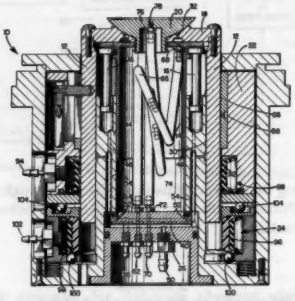
1. A brake service air module comprising a unitary housing having a main inlet connectible with a brake service air source, a main outlet connectible with an air operable braking mechanism, a flow passage through the housing normally communicating the main inlet with the main outlet, an air signal outlet from the housing branching off the flow passage adjacent the main inlet connectible with an air inlet of a wheel lock-up air signal transmitting control device, quick acting valve means in the housing having response upon application to it of an air signal to interrupt communication of the flow passage with the main outlet and to connect the main outlet with a vent passage, an air signal admission port to the housing adjacent the main outlet connectible with an air signal outlet of the control device, the admission port being connected in the housing for application of an admitted air signal to the quick acting valve means.

3,969,004

AIR BEARING PISTON ASSEMBLY FOR SEMICONDUCTOR MASK-TO-WAFER ALIGNER

Gerd Schliemann, Saratoga, Calif., assignor to The Computervision Corporation, Bedford, Mass.

Filed Aug. 2, 1974, Ser. No. 494,111
Int. Cl.² F16C *7/04*
U.S. Cl. 308—9 **7 Claims**



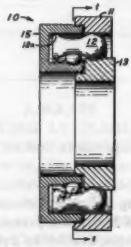
1. In a semiconductor mask-to-wafer aligner, an air bearing piston assembly for raising a semiconductor wafer to a mask comprising:
movable piston means;
a ball table mounted on said piston means with a hemispherical leveling ball movably positioned in said ball table;
means for establishing an air bearing between said ball and ball table; means for establishing either a vacuum or a pressure at the central portion of the flat surface of the hemispherical leveling ball;
means for guiding said piston means;
means for establishing an air bearing between said piston means and said piston guide means; and,
means for moving said piston means.

3,969,005

ROLLING CONTACT DEVICES

Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811

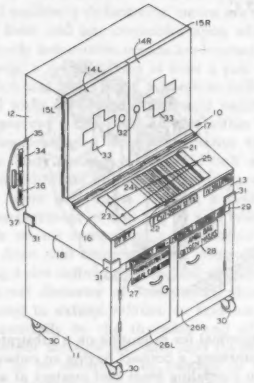
Filed Dec. 13, 1973, Ser. No. 424,553
Int. Cl.² F16C *19/20*
U.S. Cl. 308—209 **8 Claims**



1. A rolling contact device comprising:
at least two bearing races,
said bearing races including circular surfaces,
first rotating means,
said first rotating means including a plurality of major rotating elements in rolling contact with said circular surfaces of said races,
second rotating means,
said second rotating means including a plurality of minor rotating elements alternately interposed between said

major rotating elements to prevent their mutual contact and engaging the same in rolling contact,
circular retaining means,
said circular retaining means being in rolling contact with said secondary rotating means and serving to hold the same in position,
there being only one contact between adjacent rotating elements,
there being no sliding contact in said device.

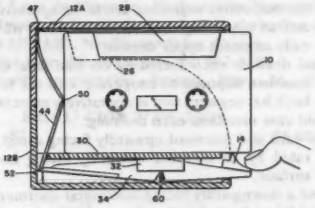
3,969,006
MEDICAL EMERGENCY TREATMENT CABINET
Loy G. Brown, 609 Fairchild Drive, Fort Worth, Tex. 76114
Filed Sept. 13, 1973, Ser. No. 396,746
Int. Cl.[2] A47B *81/00*; **B42F** *1/00*
U.S. Cl. 312—234.1 **1 Claim**



1. In a medical emergency patient treatment unit, a cabinet structure with doors opening to display accessibly located medications, supplies, and equipment located in coordinate use groups; wherein such cabinet structure includes an upper section having said doors mounted by vertical hinges at the outer edges to close and open in and out from the mid-region, a bin below and extending forward from said upper section having the doors, a lid on the top of said bin, hinged at the rear adjacent the front of said upper section, with the bin lid and the top forepart of the bin sloping downwardly from the lid hinge to the front of the bin; emergency treatment instructions being fastened to the top of said bin lid, said instructions comprising color code indexed emergency treatment instruction sections respectively color coordinated with color coding of said coordinate use groups; a quick release elastic cord connected at opposite ends to emergency treatment instruction book bin lid fastening means, cord loop hook means fastened to said bin lid in position for book-page-hold-down by said elastic cord, when the cord is looped over said hook means; and bulk storage locations correspondingly color code labeled for special treatment equipment.

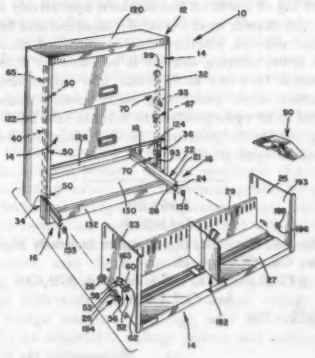
3,969,007
CASSETTE DISPENSER
Alan B. Lowry, Canton, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Filed Feb. 21, 1975, Ser. No. 551,513
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—15 **11 Claims**

1. A cassette dispenser comprising;
a housing,
means dividing the housing into a plurality of cassette accommodating compartments,
a plurality of release keys, one being associated with each compartment and each having means for locking the cassette in the compartment when the key is not actuated including a lip for contacting a front edge of the cassette.



means for supporting each key so that the key is movable to an actuated position,
and means coupled from each key supporting means forming a hinge that is integrally formed with the supporting means and that contacts the cassette so that upon actuation of the key the hinge bends and urges the cassette from the housing.

3,969,008
SAFETY LATCH AND DRAWER MOVEMENT SEQUENCING CONTROL ARRANGEMENT FOR FILE CABINETS
Charles C. Pergler, Aurora, Ill., assignor to All-Steel Inc., Aurora, Ill.
Filed June 27, 1975, Ser. No. 590,880
Int. Cl.[2] E05C *7/06*, *15/04*
U.S. Cl. 312—221 **14 Claims**



1. In a filing cabinet comprising a frame mounting a plurality of superposed drawers for independent horizontal shifting movement between open and closed positions, and a safety latch arrangement, for precluding the movement of more than one of said drawers at a time from said closed to said open position, including a vertically disposed latch bar mounted adjacent the drawers and means for actuating said bar, when one of the drawers is moved to open position, to latch the remaining drawers against movement to open position, the improvement wherein the cabinet includes a drawer movement sequencing device,
said device comprising:
a vertically disposed slideway positioned along one side of the drawers,

said slideway having disposed therein a latch bar segment for operative association with each of said drawers,

said segments being in discrete vertically stacked relation and being mounted in said slideway for vertical movement therealong from an inoperative at rest position lengthwise of the slideway,

said segments each including:

a lower lug disposed at the level of the drawer with which the respective segments are to be operatively associated and an upper lug disposed at the level of the next vertically adjacent upper drawer,

said drawers each including on said side of same a cam member disposed to cooperate with the lower lug of the latch bar segment that is operatively associated therewith,

said cam members each defining:

forward and rearward upwardly facing ramp surfaces separated by an elevated upwardly facing horizontal guide surface,

and a downwardly facing horizontal abutment surface,

said lower lugs of said segments being elevationally located thereon to dispose the lower lug of the respective segments, in said at rest position thereof, at the level of and for camming engagement by said ramp surfaces of the cam member of the drawer operatively associated therewith,

said upper lugs of said segments being elevationally located thereon, in the at rest position of said segments, to dispose the upper lugs of the respective segments, adjacent to but below the level of the cam member abutment surface of the next vertically adjacent upper drawer, for abutting engagement therewith,

whereby, when a lower segment is elevated by moving a first lower drawer from its closed position toward its open position, the cam member of such lower drawer at its upwardly facing surfaces engages the lower lug of the latch bar segment operatively associated therewith to cam same and the segments supported thereon upwardly whereby a second drawer above such moving lower drawer if also moving toward its open position has its cam member abutment surface jammingly engaged by the upper lug of the latch bar segment operatively associated with the drawer next vertically adjacent and below such second drawer, whereby further outward movement of such lower moving drawer is blocked by those of said segments between such lower and upper drawer cam members while permitting such second drawer to be moved to its open position to actuate said latch bar actuating means to preclude further drawers from being moved to open position.

3,969,009

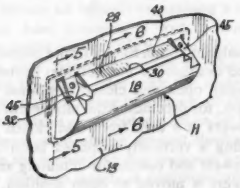
HANDLE

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Co., Chicago, Ill.

Filed May 21, 1975, Ser. No. 579,674

Int. Cl.² A47B *95/02*

U.S. Cl. 312—320 **3 Claims**



1. In combination with a sheet-material front member for a movable element, said front member having an aperture therein, a handle seated in said aperture comprising

a. an escutcheon plate overlapping said aperture on the outer face thereof,

b. a cup portion extending rearwardly of the escutcheon plate to facilitate digital manipulation of the movable element and including an upper wall member,

c. said upper wall member having an angular shoulder portion on the outer face thereof, and

d. a resilient detent member extending downwardly and inwardly from said front member adjacent said aperture, said detent member engaging said shoulder for releasably locking the handle to the front member.

3,969,010

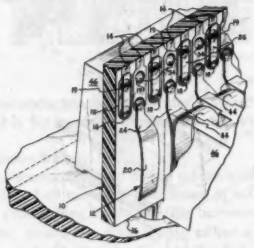
SUBSTRATE WITH IMPROVED CONTACT TERMINALS

William Kirby Nailor, III, Camp Hill, and David Clyde Thompson, Mechanicsburg, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 17, 1974, Ser. No. 471,023

Int. Cl.² H05K *1/06*

U.S. Cl. 339—17 C **11 Claims**



9. A contact terminal for mounting on a substrate along an edge thereof comprising, a contact having an outward bow, a transition section extending from said contact at an angle to the longitudinal axis of said contact, and a narrowed tail connected to said contact through said transition section, said tail having a longitudinal axis substantially parallel with and offset from the longitudinal axis of said contact.

3,969,011

ATTACHMENT ASSEMBLY FOR PREVENTING IMPROPER POSITIONAL MOUNTING

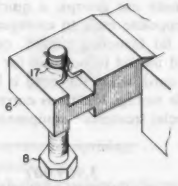
Shinji Yamada, Yoyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 19, 1974, Ser. No. 498,622

Claims priority, application Japan, Aug. 22, 1973, 48-97570[U]; June 22, 1974, 49-72724[U]

Int. Cl.² H02B *1/02*; F16B *39/284*

U.S. Cl. 339—125 R **3 Claims**



1. An attachment assembly for mounting one of a pair of male and female connectors to a frame body in a manner preventing improper positioning thereof, said assembly comprising a threaded bolt, means on said frame body through which said bolt may extend into engagement with said one connector for mounting said connector to said frame body, a

nut mounted on said one connector and including a central threaded bore adapted to be threadedly engaged by said bolt, resiliently deformable means fixed relative to said one connector and located proximate said nut on one side thereof, said resiliently deformable means being configured to prevent threaded engagement of said nut by said bolt from the side thereof upon which said deformable means are located but to permit said bolt to become threadedly engaged with said nut when said bolt is inserted from the opposite side thereof, with said bolt acting to cause resilient deformation of said deformable means as said bolt is turned in threaded engagement with said nut to extend first through said nut and then into abutment with said deformable means thereby to permit secure threaded engagement between said bolt and said nut, said assembly being configured to permit said one connector to be mounted upon said frame body only when positioned relative thereto in a manner to permit said bolt to pass through said means on said frame body through which said bolt may extend into engagement with said connector and subsequently through said nut from the side thereof opposite the side upon which said resiliently deformable means are located, a flange extending from said one connector upon which said nut and said resiliently deformable means are located, means defining in said flange a recess having at least a pair of parallel walls within which said nut is fitted, said nut including at least a pair of parallel walls cooperating with said parallel walls of said recess to prevent rotation of said nut within said recess, said flange being positioned to extend relative to said means on said frame body through which said bolt may extend into engagement with said one connector to permit mounting of connector upon said frame body in a desired position by threaded engagement of said nut by said bolt, said resiliently deformable means comprising a thin-walled fin-like section extending from said connector and integrally formed therewith having a slot defined therein, said slot having a width less than the crest diameter of said central threaded bore and being located to extend relative to said nut to be engaged generally centrally by the threaded end of said bolt after passage thereof through said nut, said fin-like section being configured to be deformed by passage of said bolt therethrough in a manner to create a resilient engaging force between said fin-like section and said bolt.

3,969,012

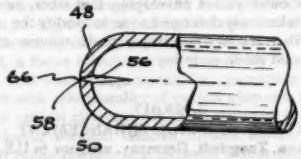
STAMPED CONTACT TIP

Anton Ernst Bauer, Neckarsulm, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 31, 1974, Ser. No. 519,420

Int. Cl.² H01R *13/06*

U.S. Cl. 339—252 P **8 Claims**



1. A pin contact formed from a stamping rolled into an annularly shaped wall with one end adapted to be inserted in a receptacle contact, the improvement comprising:

spaced cutaway portions extending axially from said one end with each cutaway portion having a bevelled end edge surface extending between an outer and an inner annular surface with the outer surface of said annular shape extending axially beyond the end of the inner surface of said annular shape and the ends of the outer surface of said cutaway portions engaging to form a closed seam in response to the folding of said cutaway portions towards each other and the axis of said annular shape.

3,969,013

THERMALLY CONTROLLED MICROSCOPE STAGE ASSEMBLY

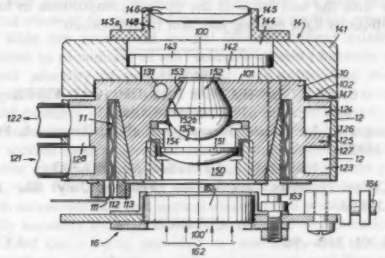
Bernard Poty, Gondreville; Jacques Leroy, Vandoeuvre-les-Nancy, and Leon Jachimowicz, Saulxures-les-Nancy, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Mar. 25, 1975, Ser. No. 562,039

Claims priority, application France, Mar. 26, 1974, 74.10227

Int. Cl.² G02B *21/06, 21/34*

U.S. Cl. 350—87 **15 Claims**



1. A thermally controlled microscope stage assembly for use in measuring transformation temperatures between −180° and +600°C, comprising a thick-walled platen with means for heating and means for cooling a specimen, a lighting well extending through said platen so as to be along the optical axis of the objective of a microscope associated therewith, a condenser for an illuminating beam built in said lighting well, the surface of the condenser facing the objective of the microscope containing the isophote plane of the condenser and lying level with the top surface of said platen, a specimen chamber bounded along its bottom by said platen, along its sides by a thick lateral wall in thermal contact with said platen, and along its top by a thin transparent platen member, heating supply means and cooling supply means for supplying respectively said means for heating and cooling the specimen, thermometric means including a resistance probe disposed in said platen adjacent the bottom of said specimen chamber and voltage measuring means, said resistance probe forming one arm of a linearizer bridge, heating relay means and cooling relay means connected respectively in series with said heating supply means and said cooling supply means and thermostat control means, said thermostat control means selectively controlling one of said relay means in response to the sign of the voltage difference between the output voltage of said linearizer bridge and a set voltage, said set voltage being provided by an adjustable voltage source and corresponding to a desired set temperature.

3,969,014

PHOTORESIST LAYER WAVEGUIDE COUPLING DEVICE

Franz Auracher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 16, 1974, Ser. No. 533,323

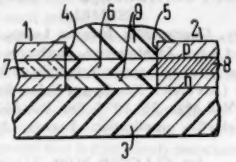
Claims priority, application Germany, Dec. 19, 1973, 2363253

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **10 Claims**

1. A coupling device for the transfer of light transmissions containing signals between optical components comprising a substrate, two optical components each having an end face,

said components having a portion adjacent its end face disposed on the substrate with the end faces of the two components being in spaced relationship, a developed, transparent, negative photo-resist layer disposed on the substrate between



said end faces and in contact therewith, said photo-resist layer being formed so that its end faces are matched and coextensive with the end faces of the optical components to form a continuous light guiding junction therebetween.

3,969,015

CABLE CONNECTOR FOR OPTICAL FIBER TRANSMISSION

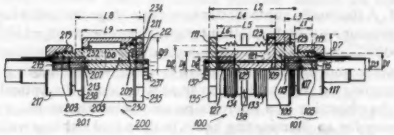
Georges E. Le Noane, Kerrougant, Bras, Tregastel, France 22730

Filed July 7, 1975, Ser. No. 593,503

Claims priority, application France, July 26, 1974, 74.25994

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C **4 Claims**



1. A connector for armored cables used for transmission via optical fibres adapted to connect a first cable end having a threaded male element to a second cable end having a threaded female element comprising:

a threaded male connecting element having a body portion, a front half-portion, a rear gripping portion, an elastic unit and a first nut to longitudinally secure the armor of said first cable end and simultaneously secure each optical fibre of said first end, said elastic unit consisting of an elastomer pad-metal piston unit constituting the fibre securing assembly of said male connecting element;

said front half portion of male connecting element consisting of a second nut, a second elastomer pad-metal unit and an embedded washer at the front end thereof whereby each of the ends of the optical fibres of said first cable end lies in the end surface at the face of said embedded washer to provide a smooth surface of fibre ends which is coplanar with the front surface of said washer, and said embedded washer being adapted to be expelled from said fron half connecting element by means of said second nut;

a threaded female connecting element on the second cable end receiving said male connecting element and front half connecting portion, said female connecting element having a body portion, a rear gripping portion, a front half connector portion, a third nut and an elastomer pad-metal piston unit to longitudinally secure said second cable end and the armor of said second end while securing the optical fibres of said second end;

said front half connection portion of said female connecting element having a fourth nut and a second embedded washer at its joining end, the washer adapted to be expelled by said fourth nut of said female element in a manner similar to and simultaneous with the expulsion of the first washer by the second nut when the male and female element are joined;

said second and fourth nuts being constructed, dimensioned and arranged in relation to the outer thread of said male connecting element to provide similar male and female assemblies of similar longitudinal dimensions with the second and fourth nuts providing the ends of said assemblies in abutting relationship and in a predetermined angular position of one assembly with respect to the other;

and said second nut in cooperation with said elastomeric-pad-piston of said male connecting element being adapted for guiding the fibre ends of the two ends in the axial direction while coaxially aligning the fibre ends of the male connecting element with those fibre ends of the female connecting element.

3,969,016

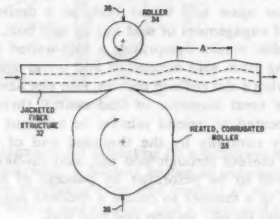
LOW DISPERSION OPTICAL FIBER WAVE GUIDING STRUCTURES WITH PERIODICALLY DEFORMED WAVEGUIDE AXIS

Peter Kaiser, Middletown, and Enrique Alfredo Jose Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1975, Ser. No. 576,043

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG **3 Claims**



1. An optical fiber waveguiding structure including at least one optical fiber waveguide having a longitudinal axis, core and cladding regions and being capable of guiding optical wave energy along said axis in a plurality of different modes of wave propagation having different group velocities, said structure further including means for reducing dispersion due to said difference in group velocities comprising means for enhancing coupling among said modes in said fiber, said structure being characterized in that said mode coupling means comprises an outer jacket enveloping said fiber, said outer jacket being selectively deformed so as to modify the straightness of said fiber axis in a spatially periodic manner effective in providing said mode coupling.

3,969,017

METHOD OF IMAGE ENHANCEMENT

Hans Dammann, Tangstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 374,512, June 28, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,694

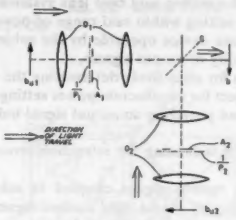
Claims priority, application Germany, July 1, 1972, 2232359

Int. Cl.² G02B 27/10

U.S. Cl. 350—162 SF **4 Claims**

1. A method of enhancing blurred images of an object with the aid of inverse filters, comprising the steps of separately forming Fourier transforms of at least two blurred images of the object blurred by different blurring factors of different imaging sources into Fourier transforms, separately filtering the Fourier transforms by inverse filters each comprising the

inverse of the Fourier transform of the blurring factor of the imaging source used to produce the respective image, and having complementary apertures separated by opaque areas



covering poles of each inverse filter, and converting the Fourier transforms into Fourier transforms to produce images of the object, and superimposing the images to produce an enhanced image.

3,969,018

OBJECTIVE SYSTEM WITH ZOOM LENS FOR PHOTOGRAPHIC APPARATUS

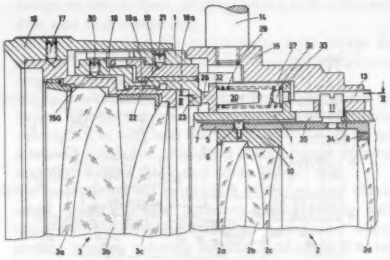
Herbert Reinsch, Kongen, and Peter Korner, Reichenbach, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1974, Ser. No. 505,601

Claims priority, application Germany, Sept. 17, 1973, 2346758

Int. Cl.² G02B *15/00*

U.S. Cl. 350—187 **11 Claims**



1. In an objective system for photographic apparatus, a combination comprising a barrel; a variable-focus picture-taking lens having a plurality of optical elements disposed in and movable axially of said barrel to thereby focus the image of a subject; a focus selector element movably mounted on said barrel; first connecting means for connecting said selector element with said plurality of optical elements so as to move selected optical elements axially in response to movement of said selector element relative to said barrel, said selector element being displaceable between a first plurality of positions to thereby move at least one first optical element of said plurality of optical elements through the medium of said connecting means during normal focusing of the image of a subject which is located within a range of first distances from the barrel, and said selector element being displaceable beyond said first plurality of positions to any one of a second plurality of positions to thereby move at least one second optical element of said plurality of optical elements through the medium of said connecting means during close-up focussing of the image of a subject which is located within a range of shorter second distances from the barrel such as correspond to the making of close-up shots, said connecting means comprising a cam, a motion transmitting member engaging said cam and operatively connected with said second optical element in each of said plurality of second positions of said selector element, and means for biasing said motion transmitting member against said cam, said motion transmitting member including a slide which is reciprocable in said barrel in parallelism with the optical axis of said lens; selector means and second connecting means for connecting said selector means with said second optical element, said selector means being movable with respect to said barrel to thereby move said second optical element axially and to thus change the focal length of said lens, said second connecting means comprising a second cam in said barrel and a follower operatively connected with said first optical element, tracking said second cam and rotatable by said selector means, said barrel further having a longitudinally extending groove and said slide having a slot into which said follower extends in a predetermined axial position of said second optical element, said follower further extending into said groove in response to movement of said second optical element to said predetermined axial position whereby said slide can move said second optical element axially in response to movement of said selector element between said second plurality of positions, said first connecting means comprising a third cam which is engaged by said slide in each of said plurality of first positions of said selector element, the slope of said third cam being such that the axial position of said second optical element remains unchanged while said selector element moves between said plurality of first positions, said first connecting means further comprising a ring which surrounds said first optical element and is rotatably and axially movably mounted in said barrel, said first mentioned and third cams being provided on said ring, and said ring comprising a protuberance disposed between said first mentioned and third cams and over which said slide rides against the opposition of said biasing means during movement of said selector element beyond said plurality of first positions; and means for confining said selector element to a single type of movement with respect to said barrel both during its displacement between said first plurality of positions and during its displacement between said second plurality of positions.

3,969,019

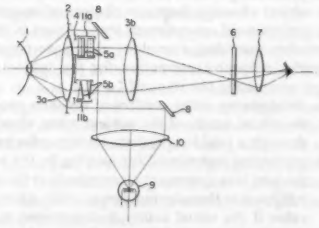
CURVATURE MEASURING OPTICAL SYSTEM IN OPHTHALMOMETER

Masao Nohda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 7, 1975, Ser. No. 565,619

Int. Cl.² A61B *3/02*

U.S. Cl. 351—13 **3 Claims**



1. In a curvature measuring optical system in an ophthalmometer comprising a first lens group having a focal point thereof lying at the location of the virtual image of an index projected on the cornea of an eye to be examined, a second lens group for focusing on the focal plane thereof a light beam made parallel by said first lens groups, and rotary prisms disposed between said first and said second lens group to separate the image into two images and rotatable in the opposite directions from each other, whereby said rotary prisms may be rotated by a rotating member therefor to align the separate reflected images with each other on the focal plane

in a predetermined relationship, thereby measuring the curvature radii of the cornea from the angles of rotation of said rotary prisms, the improvements residing in the provision of a light-intercepting member formed with at least three openings and disposed just behind said first lens group to divide the light beam between said first and said second lens group, a first rotary prism member disposed just behind one of the openings in the light-intercepting member to receive the light passing through the first lens group and said one opening and to cause a light beam corresponding to said one opening to be deflected on the focal plane in a predetermined direction, a second rotary prism member disposed just behind another one of said openings to receive the light passing through the first lens group and said another opening and to cause a light beam corresponding to said another opening to be deflected on the focal plane in a direction perpendicular to the direction of deflection by said first rotary prism member, and means for measuring the respective angle of rotation of said first and second rotary prism members.

3,969,020

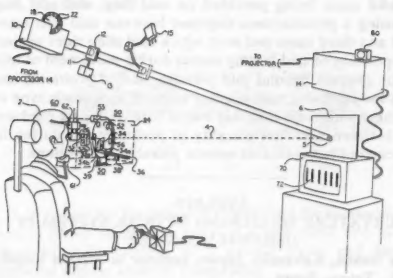
AUTOMATIC REFRACTION APPARATUS AND METHOD

John R. Lynn, and George W. Tate, Jr., both of Dallas, Tex., assignors to Giles C. Clegg, Jr., Dallas, Tex., a part interest

Filed Dec. 28, 1973, Ser. No. 429,143

Int. Cl.² A61B 3/02

U.S. Cl. 351—17 **48 Claims**



1. In an automatic process for subjectively determining the refractive error of a subject wherein the power of lenses of a trial lens system presented to the subject is controlled by a data processing system in response to responses derived from the subject choosing between choices of images presented to the subject until an optimum lense power is determined and thereafter providing a readout of a lense prescription which provides refractive correction for the subject, the improvement comprising the steps of:

a. determining under control of the data processing system the visual acuity of the subject when viewing test stimuli through a trial lens system set at a selected power,

b. presenting test stimuli for viewing by the subject through the trial lens system set alternatively at the selected power $+\Delta D$ and at the selected power $-\Delta D$, where ΔD has a first value if the visual acuity is determined in step(a) to be greater than a predetermined threshold value and where ΔD has a second value greater than said first value, if the visual acuity is determined in step (a) to be less than the threshold value,

c. determining under control of the data processing system whether one of the trial lens system power settings of selected power $+\Delta D$ or $-\Delta D$ is preferred by the subject over the other for viewing the test stimuli, and

d. repeating steps (a) – (c) above at frequent intervals during the process.

10. Apparatus for measuring refractive error of a subject comprising:

display means for displaying test symbols,

a trial lens system continuously variable over a range of powers through which the subject views the displayed test symbols,

control means for setting said trial lens systems at any selected power setting within said range of powers,

a manual response device operable by the subject for providing a plurality of output signals,

objective means for objectively determining the visual acuity of the subject for any discrete power setting of the trial lens system and providing an output signal indicating the test results,

display means for indicating the refraction error, if any, of the subject,

data processing system means coupled to said response device, said display means, said control means, said objective refraction means and said display means and responsive to signals received from said response device and said objective refraction means to control the control means to set the trial lens system at discrete settings of cylinder and spherical power which provide a refractive correction most desired by the subject and control the display means to indicate the test results.

3,969,021

MOTION PICTURE CAMERA WITH SOUND RECORDING MEANS

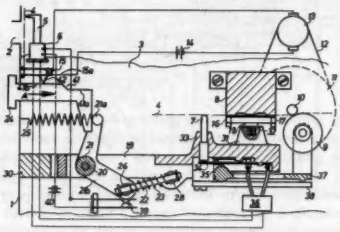
Kurt Bode, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Apr. 18, 1975, Ser. No. 569,355

Claims priority, application Germany, May 29, 1974, 2426293

Int. Cl.² G03B 31/02

U.S. Cl. 352—27 **8 Claims**

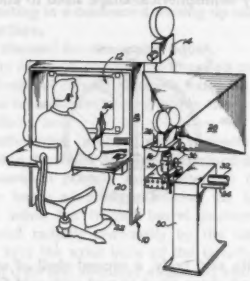


1. A motion picture camera with sound recording means, comprising a recording head and a capstan mounted in fixed locations in the camera, a mounting lever in the camera, said mounting lever being swingable between an effective position and an ineffective position, a film loop sensor for sensing a loop in said film strip, a pressure plate for pressing the film strip against said recording head, and a drum for pressing the film strip against said capstan, said loop sensor, plate, and drum being mounted on said mounting lever to move bodily therewith between respective effective and ineffective positions, spring means for respectively biasing said loop sensor, plate, and drum relative to said mounting lever, a mounting plate having a front surface and a rear surface, and a flywheel operatively connected to said capstan, said flywheel being located on the rear side of said mounting plate in close proximity to the rear face thereof, said recording head being mounted on the front surface of said plate, said capstan projecting forwardly from the front surface of the plate, and said mounting lever being arranged along said front surface of said plate and swinging in a direction substantially parallel to the front surface of said plate.

3,969,022
SYSTEM FOR PRODUCING A COLORED MOTION PICTURE FILM FROM BLACK-AND-WHITE MEDIUM

Deloy J. White, Andes 51, Mexico City 20, Mexico

Filed Mar. 9, 1971, Ser. No. 122,299
Int. Cl.² G03C 11/18
U.S. Cl. 352—38 1 Claim



1. The method of converting a black-and-white motion picture film to a colored motion picture film comprising:

projecting a first black-and-white light image from a first frame of the black-and-white motion picture film onto a surface of a screen;

painting a spreadable adhering coloring substance on said screen at selected areas of the projected first black-and-white image to provide a first composite of applied color substance and superimposed first black-and-white image;

while maintaining the projection of the first black-and-white image on said surface, photographing with color-sensitive film said first composite;

projecting a second black-and-white light image from a second frame of the black-and-white motion picture film onto the surface of the screen;

painting a spreadable adhering coloring substance on said screen at selected areas as necessary to synchronize the colored areas with said black-and-white image to provide a second composite of applied color substance and superimposed second black-and-white image; and

while maintaining the projection of the second black-and-white image on said surface, photographing with the color-sensitive film said second composite where the surface bearing coloring substance as applied to register with the first projected frame is horizontally and vertically moveable to effect partial or total registration of previously applied coloring substance to the black-and-white image from the second projected frame.

3,969,023
METHOD AND APPARATUS FOR DETECTING LAYERS OF STRESS IN LENSES

Neill M. Brandt, Sturbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

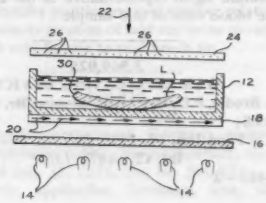
Filed Mar. 6, 1975, Ser. No. 556,023
Int. Cl.² G01B 11/16
U.S. Cl. 356—33 1 Claim

1. The method of determining the presence, absence and type of treatment of lenses for impact resistance by visual observance of layers of surface stress in the lenses comprising the steps of:

immersing a test lens of glass having a predetermined index of refraction in a liquid having a refractive index at least approximating that of the lens;

directing light which is linearly polarized in a given fixed direction through said immersed lens for transmittance away therefrom toward a remote observation location;

interposing between said observation location and immersed lens a linear light-polarizing analyzer having an axis of polarization directed approximately orthogonally to said given direction of polarization of said light whereby patterns of alternate areas of brightness and darkness produced by the test lens and observed directly upon said lens from said observation location will indicate



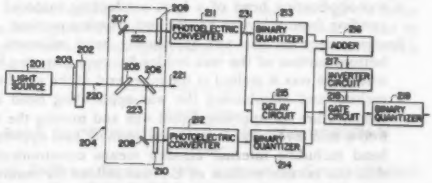
layers of stress in said lens while an absence of such patterns will indicate a lack of surface stress in the lens and particular configurations of observed patterns will indicate the type of treatment; and

rotating the test lens in said liquid and observing whether said patterns of alternate areas of darkness move with rotation of the lens, non-movement of said patterns of darkness verifying a finding of layers of stress in the lens.

3,969,024
SIGNAL SEPARATION SYSTEM USED FOR AN AUTOMATED CLASSIFICATION OF WHITE BLOOD CELLS

Akihide Hashizume, Kokubunji; Hideki Kohno, Tokyo, and Shinji Yamamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 13, 1975, Ser. No. 604,185
Claims priority, application Japan, Aug. 14, 1974, 49-92329
Int. Cl.² G01N 33/16
U.S. Cl. 356—39 15 Claims



1. A signal separation system comprising:

first means for generating a beam of light and directing said beam of light through a sample of whole blood;

second means, disposed in the path of the light beam which has passed through said sample of whole blood, for separating said light beam into first and second light beams, the magnitude of information representative of the nuclei of white blood cells in said sample being higher in said first light beam than in said second light beam, and the magnitude of information representative of red blood cells in said sample being higher in said second light beam than in said first light beam;

third means, disposed to receive said first and second light beams, for generating first and second electric signals representative thereof;

fourth means, receiving the first and second electric signals generated by said third means, for quantizing said first and second electric signals with respect to first and second prescribed threshold levels, and producing respective first and second binary signals representative of the quantized first and second electric signals;

fifth means, coupled to said fourth means, for combining said first and second binary signals and producing a first

separation signal which contains a signal component representative of the nuclei of white blood cells in said sample and a signal component representative of red blood cells in said sample; and

sixth means, coupled to said fifth means, and said third means, and responsive to said first separation signal and the output of said third means, for producing a second separation signal representative of the cytoplasm in the white blood cells of said sample.

3,969,025

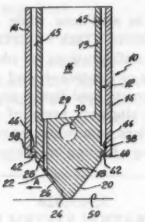
WAX APPLICATING DEVICE

James A. Brodie, P.O. Box 1448, Lennoxville, Quebec, Canada (J0B 1Z0)

Filed Jan. 20, 1975, Ser. No. 542,199

Int. Cl.² A47L *13/32*

U.S. Cl. 401—2 **9 Claims**



1. A portable wax-applicating device for manually applying a thin coat of wax on the running surface of skis or the like, comprising: a wax-holder having a bottom surface and comprising a compartment for holding a piece of solid wax to be progressively melted at its inner end at the bottom surface; a gripping portion circumposed in insulated relation about said wax-holder for accommodating the hand of a user as wax is melted and applied to a running surface;

a wax-applicating head of a heat-conducting material depending from said wax-holder and gripping portion;

heater means on the wax-applicating head adjacent the bottom surface of the wax-holder for concentrating heat where the wax is melted at the inner end of the wax being melted, and maintaining the wax-applicating head at a temperature for applying liquid wax and ironing the wax into a thin layer after it has been applied, said applicator head including internal conduit means communicating with the bottom surface of the wax-holder for receiving melted wax, said applicator head having a substantial width defined by two convergent faces extending the width of the applicator and terminating in a lower transverse edge, said conduit means opening into one of the faces which one face comprises an application face when the melted wax discharges onto the one face and is applied as a thin coat the width of the applicator head when the device is moved in one direction, said other face comprising an ironing face for ironing a thin layer of the melted wax as the device is moved in an opposite direction, said transverse edge comprising means for forming a liquid head of melted wax between the respective faces and the surface upon which the wax is applied.

3,969,026

WAXING AND POLISHING APPARATUS

Jerry W. Johnson, 5351 Bechtol Court, Marion, Ind. 46952

Filed Apr. 21, 1975, Ser. No. 570,272

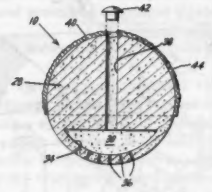
Int. Cl.² A47L *13/26*

U.S. Cl. 401—37 **5 Claims**

1. A waxing and polishing apparatus comprising a spherically-shaped body of elastically resilient material having a cavity therein that cooperates with a first portion of the spherical surface of said body to define a wall therebetween, having a plurality of fluid-communicating apertures for fluid dispersal upon a forceful rubbing applied to said body, said apertures interconnecting said cavity and said first portion, and having a passage interconnecting said cavity and a second portion of said spherical surface distal from said first portion;

means for removably plugging said passage; and

a spherically-shaped housing comprising a first shell of substantially hemispherical shape sized to encase and to



conform with said body, a second shell of substantially hemispherical shape sized to nest with said first shell on the outside thereof, and means for pivotally interconnecting said shells to permit said shells to be relatively positioned to form a spherical case enclosing said body and to permit said shells to be nested in a first position thereby selectively exposing said apertures for fluid dispersal and nested in a second position thereby selectively covering said apertures and exposing a second portion of body surface for polishing.

3,969,027

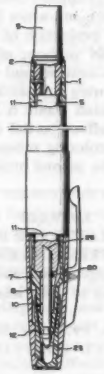
WRITING INSTRUMENT

George Andrew Randar, Canoga Park, and Harris William Young, Oxnard, both of Calif., assignors to The Gillette Company, Santa Monica, Calif.

Filed Apr. 3, 1975, Ser. No. 564,784

Int. Cl.² B43K *5/00, 1/02*

U.S. Cl. 401—199 **1 Claim**



1. In a writing instrument having a main hollow barrel portion containing an absorbent ink-impregnated filler and a tapering frontal barrel portion providing an external elongated finger positioning surface area, the improvement comprising the provision of:

said tapering frontal barrel portion being so provided as to be resiliently deformable radially outwardly of an axial bore thereof;

locking shoulder means formed in said frontal barrel portion at the frontal entrance to said bore for presenting a pair of inwardly extending shoulders facing in opposing axial directions; and

an elongated writing element being relatively non-deformable relative to said frontal barrel portion and composed of a homogenous thermoplastic polymeric composition, including a shank having a frusto-conical frontal portion terminating in a contoured writing tip surface, and a rear end surface,

an axial channel for conveying liquid,

a plurality of liquid conducting channels radially extending therefrom, all of said channels extending from said rear surface to and terminating within the contoured writing tip surface, and

a circumferential groove with oppositely facing walls formed in the shank at a predetermined distance from the frusto-conical portion and contoured tip surface, said groove being adapted to receive the locking shoulder means when the frontal barrel portion is temporarily deformed radially outwardly by the element being inserted into the axial bore of the tapering frontal barrel portion until said shoulder means fits into said groove, the locking shoulder means being then retained in the groove by the resilience of the frontal barrel portion, a constrictive effect thereof being absorbed by a continuous layer of thermoplastic polymer composition over the array of radial liquid-conducting channels, the element being thereby restrained from axial displacement in said bore under shock and writing pressure without constriction or impairment of said channels or variation in relative spatial position of said contoured writing tip surface and finger positioning area.

3,969,028

DRAWING AND WRITING BRUSH-PEN WITH ROUND AND FLAT HAIR AND ADJUSTABLE FLOW OF PERMANENT LIQUID INK

Salvio Correia Lima Negreiros, Rua Marques de Olinda 90 No. 43, Rio de Janeiro, Brazil

Filed July 11, 1974, Ser. No. 487,637

Claims priority, application Brazil, July 12, 1973, 5194

Int. Cl. A46b *11/04*

U.S. Cl. 401—279 **8 Claims**

1. A brush-pen of round and flat hair and permanent liquid ink with adjustable flow for drawing and writing, comprising a cylindrical ink container having on one end a threaded removable cap for refueling and on the other end a ferrule with a brush tip, a passage for ink flow from the ink container through the ferrule to the brush tip including a stopper adjacent said ferrule and adapted to vary the passage through said ferrule in response to the position of said stopper relative to said ferrule, a shaft extending from said cap through said ink container and connected to said stopper, means for biasing said shaft into pressure contact with said cap, a freely movable hollow piston carried adjacent said stopper and cooperating in abutting relation with said biasing means, said hollow piston being movable axially within said cylindrical ink container against said biasing means in response to the axial shaking of the brush-pen to thereby clear dried ink from the interior of the ink container and means on said cap for selectively moving said shaft and thereby positioning said stopper relative to said ferrule in response to rotation of said cap so as to vary the ink passage through said ferrule to said brush tip.

3,969,029

SHAFT COUPLING

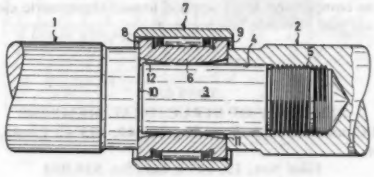
Georg Schaeffler, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed July 15, 1975, Ser. No. 596,071

Claims priority, application Germany, Aug. 16, 1974, 2439334

Int. Cl.² F16D *1/00*

U.S. Cl. 403—26 **2 Claims**



1. A shaft coupling comprising a first shaft provided at its end with an extension of a reduced diameter engaging a longitudinal bore in the end of a second shaft with the connection in the bore being effected by a screw thread, a roller bearing with its inner race arranged on the extension between the two shafts with the end surfaces of the two shafts bearing firmly on the end surfaces of the inner race of the bearing, the inner race having a bore with a slightly convex contour so that its longitudinal axis can slightly deviate from the longitudinal axis of the shaft when mounted.

3,969,030

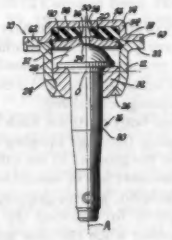
BALL JOINT WITH COMPOSITE COMPRESSION SPRING

Leo S. Sullivan, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,211

Int. Cl.² F16C *11/06*

U.S. Cl. 403—132 **4 Claims**



1. A ball joint comprising:

a housing having an outward peripheral flange at an open end thereof and a reduced opening at the opposite end,

a ball stud unit having a ball portion engaging a fixed bearing seat in said housing adjacent said reduced opening

and a stud portion disposed outwardly of said reduced opening;

a movable bearing seat disposed in said housing and having a dome shaped central portion engaging said ball portion,

a hat-shaped cover having an outward peripheral flange secured to the outward peripheral flange of said housing and forming an internal crevice shaped peripheral groove at the juncture therewith; and

a composite compression spring disposed between said cover and said movable bearing seat preloading said bearing seats into engagement with said ball portion and taking up wear therebetween,

said composite compression spring comprising an elastomeric element having a depending peripheral skirt portion adjacent an outer peripheral edge of said upper bearing seat which seals the junction between said housing and said cover, and

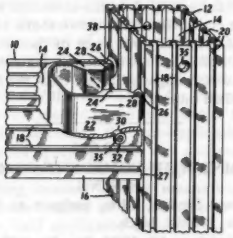
a stabilizer disc bonded to an end surface of said elastomeric element inward of said skirt portion and engaging a surface of said movable bearing seat for inhibiting the migration of said elastomeric element past the outer peripheral edge of said movable bearing seat responsive to compressive loads applied to said elastomeric element via said movable bearing seat.

3,969,031

ASSEMBLY OF STRUCTURAL MEMBERS

Karl-Gunnar Kroopp, Farnebogatan 62, 123 42 Farsta, Sweden

Filed Nov. 15, 1974, Ser. No. 524,054
Int. Cl.[2] F16B *9/00*; B25G *3/00*
U.S. Cl. 403—239 **5 Claims**



1. An assembly of structural members comprising one structural member having an opening in one surface thereof, another structural member having spaced, parallel grooves extending along an outer surface, and a coupling inserted in the opening, the coupling comprising:

yieldably spaced body portions, each body portion having a claw protruding from the opening and received in a different one of the grooves of the other structural member while the members are in assembled relation, each claw having an inclined, groove-gripping surface cooperative with the groove for drawing the coupling toward the grooved member when the claw grips the groove; and

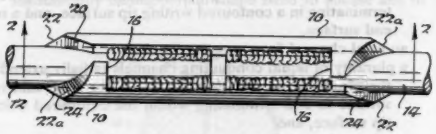
a fastener engaging the body portions for moving the body portions toward each other until the claws grip the grooves, the fastener also connecting the one structural member to the coupling for drawing the one structural member toward the other with the coupling until the structural members are in butting engagement.

3,969,032

ROD SPLICE

Richard J. Wolicki, Buffalo, N.Y., assignor to Buffalo Brake Beam Company, Lackawanna, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,521
Int. Cl.[2] F16B *2/02*, *7/04*; F16D *1/00*, *1/02*
U.S. Cl. 403—310 **5 Claims**



1. A rod repair splice means for repairing a rod to be spliced, said repair splice comprising:

a pair of body members, each said body member being of generally trough shaped cross section for fitting partially about the periphery of the rod to be spliced;

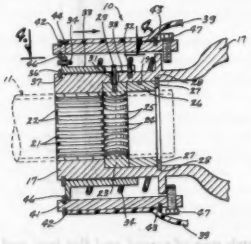
each of said body members having opposite, longitudinally extending side edge portions and opposite end portions and at least one arcuate flange adjacent to at least one end thereof and extending laterally beyond one of said side edge portions thereof; said members being mounted diametrically opposite to each other on the rod to be spliced with said flange of each member at opposite ends of the splice; and said side edge portions of said body members being adapted to be welded to the rod to be spliced and at least one pair of diametrically opposite end portions of said members sloping toward the rod in a manner avoiding shoulders which might cause hang-up upon axial movement of the repaired rod wherein each of said pair of diametrically opposite end portions includes a central sloping portion extending from the outer surface of said respective body member to the inner surface thereof and longitudinally receding, laterally extending sloping portions on opposite sides of said central portion and also extending from the outer surface of said respective body member to the inner surface thereof, said latter portions intersecting said central portion to form a plurality of distinct camming surfaces.

3,969,033

TORQUE TRANSMITTING COUPLING

Florian B. Recker, 802 First St., SE., Dyersville, Iowa 52040

Filed July 10, 1975, Ser. No. 594,784
Int. Cl.[2] F16B *7/00*
U.S. Cl. 403—322 **14 Claims**



1. A torque transmitting coupling comprising:

a housing;

an opening in said housing, a portion of said opening being circular and a portion of said opening being non-circular, said opening being adapted to receive a non-circular portion of a shaft;

a sleeve rotatably disposed within said circular portion of said opening, the inner configuration of said sleeve being

of the same general shape as the shape of the noncircular portion of the opening in the housing;

a collar surrounding a portion of said housing, said collar being longitudinally slidable and having a first position and a second position;

means for preventing said collar from rotating with respect to the housing;

a radial slot formed in said housing;

a pin connected to said sleeve and extending radially therefrom, a portion of said pin being disposed in said radial slot and a portion thereof extending beyond said radial slot in the housing; and

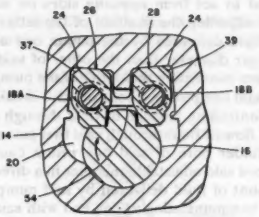
camming means connected to said collar for moving said pin and thereby said sleeve to one position when said collar is moved to said first position and for moving said pin and thereby said sleeve to another position when the collar is mvoed to the second position.

3,969,034

WEDGE LOCK WHEEL ASSEMBLY

Edward M. Gaul, Naperville; Aldo Allori, Brookfield, and Thomas Hillstrom, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Substitute for Ser. No. 457,046, April 1, 1974, abandoned.
This application Apr. 18, 1975, Ser. No. 569,510
Int. Cl.² F16D *1/08*; **B60B** *37/04*
U.S. Cl. 403—357 **6 Claims**



1. A wedge lock wheel assembly for mounting a tire rim having a vertical center disc, the assembly comprising:

a hub rigidly attached to said rim having chamber with a centerline substantially perpendicular to said disc, said chamber comprising;

a plurality of stops;

a plurality of sets of paired ramps with a known hardness having complex angles relative to said disc;

at least two sets of paired wedges positioned within said chamber, capable of relative motion therebetween, and having an aperture passing through each of said pairs, a generally flat bottom surface, a sloped top surface and a hardness greater than said ramps's hardness;

a plurality of restraining means for limiting the motion between said sets of said wedge pairs;

an axle having horizontal contact surfaces with a hardness greater than said wedge hardness; and

a plurality of connecting means passing through said wedge apertures for establishing contact between said ramps and said sloped surfaces, and between said bottom surfaces and said contact surfaces.

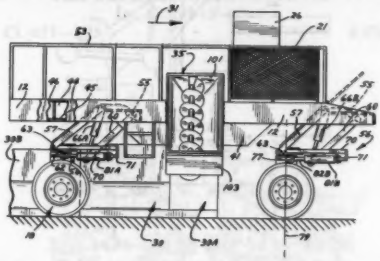
3,969,035

SLIP FROM PAVING MACHINE

Frederick J. Silbernagel, Huron, S. Dak., assignor to Precision Paving Products Corporation, Minneapolis, Minn.

Filed Feb. 28, 1974, Ser. No. 446,731
Int. Cl.² E01C *19/52*
U.S. Cl. 404—98 **21 Claims**

1. A mobile machine for slip form paving using a paving material to form a structure comprising a frame member having a leading end and a trailing end and lateral side edges, said frame member having a load conveyor mounted thereon, and means to mount a slip form on said frame for forming said paving material into the desired structure as the machine is moved forwardly, means mounting said frame for movement along a surface comprising a pair of forward surface engaging members mounted to said frame member adjacent the leading end thereof when moving in normal direction of movement for paving, means mounting said pair of surface engaging members closely adjacent the side edges and within the periphery of said frame member, a single third surface engaging member, means mounting said single surface engaging member with respect to said frame member closely adjacent one side thereof and within the frame periphery and to normally move substantially in the track of one of said forward surface engaging members as the machine moves in said normal direction of movement, and positioned adjacent to the rear of said frame member and laterally displaced from a slip form



mounted on said machine, said means to mount a slip form being positioned to trail behind the other of said forward surface engaging members, and power means mounted on said frame for powering said surface engaging members for propelling said machine including an engine positioned adjacent the forward end of said frame member between and at least partially overlying said forward surface engaging members to balance and stablize said machine, said means mounting said surface engaging members including separate movable parallel linkages for each surface engaging member, each separate parallel linkage comprising a pair of links having first ends pivotally mounted with respect to said frame member about axes positioned at fixed locations on said frame member, said links having second ends pivotally mounted to its respective surface engaging member with the links in parallel relationship about axes parallel to the spaced axes, whereby the surface engaging members remain oriented with respect to a vertical plane as the parallel linkages are moved to facilitate steering movement of the surface engaging members.

3,969,036

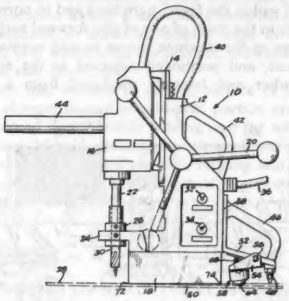
MAGNETIC DRILL

Everett D. Hougen, G-5072 Corunna Road, Flint, Mich. 48504

Filed Jan. 23, 1975, Ser. No. 543,415
Int. Cl.² B23B *39/14*
U.S. Cl. 408—76 **9 Claims**

1. In a portable magnet base drill unit of the type including a support on which a motor-driven drill is mounted, said support having an electromagnet base of generally rectangular shape, said base having a generally flat bottom face perpendicular to the axis of the drill spindle, said electromagnet when energized being adapted to magnetically adhere to an underlying flat magnetic support surface to support the drill unit thereon in a fixed location with the drill spindle projecting vertically downwardly along an axis located forwardly of the front end of the magnet base, the front edge of the bottom face of the magnet base extending transversely of the base in a generally straight line, that improvement which comprises anti-friction means mounted on said support adjacent the rear end of said magnet base and resiliently biased to project downwardly at least slightly beyond the plane of said bottom face,

said anti-friction means cooperating with the front edge of the base to slidably support the drill unit on said support surface when the magnet is in a de-energized condition with the bottom face of the magnet inclined upwardly and rearwardly at a slight angle from said front edge whereby when the drill unit is moved forwardly on said support surface to locate the drill spindle vertically above the location of the hole to be drilled therein, said front edge of the magnet base scrapes debris and



chips from the underlying support surface traversed by said front edge, the electromagnet being of sufficient strength to overcome the bias on said anti-friction means so that when the magnet is energized the bottom face thereof is magnetically attracted into firm coplanar engagement with the scraped underlying portion of the support surface and the drill unit is supported on the support surface in a firm stable position, the drill spindle axis extending perpendicular to the plane of the support surface.

3,969,037

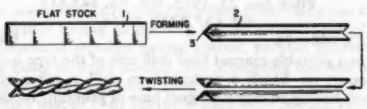
TURBULATORS

Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 490,432, July 18, 1974. This application May 7, 1975, Ser. No. 575,327

Int. Cl.² B01F 7/08

U.S. Cl. 416—176 **6 Claims**



1. A multi-vane turbulator comprising;

a plurality of relatively elongated members, each of said members being V-shaped in cross section with two straight segments integral with and joined to each other at a bend in said member and with each of said cross sectional straight segments lying on a spiral vane encircling the longitudinal axis of said turbulator, each of said bends being in contact with the other of said bends substantially along the length of said turbulator.

3,969,038

PRESSURE REGULATOR FOR AN ADJUSTABLE PUMP

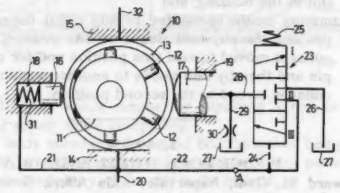
Gerhard Nonnenmacher, Korntal; Paul Bosch, Ludwigsburg, and Hans-Jürgen Fricke, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 8, 1974, Ser. No. 522,216

Claims priority, application Germany, Nov. 20, 1973, 2357801

Int. Cl.² F04B 49/00

U.S. Cl. 417—218 **6 Claims**



1. A pressure regulator for an adjustable pump having an outlet through which fluid under pressure is delivered by the pump, the pressure regulator comprising an adjustable member for regulating the amount of fluid delivered by said pump; a pair of pistons respectively axially movable in cylinder bores and arranged to act from opposite sides on said adjustable member for adjusting the position of the latter and thus the amount of fluid delivered by the pump, one of said pistons having a larger diameter than the other of said pistons; first passage means connecting the outlet of the pump to the cylinder bore of said one piston; a control valve in said first passage means for controlling passage of fluid through said first passage means, flow of fluid through said first passage means and into the cylinder bore of said one piston causing said one piston to move said adjustable member in a direction decreasing the amount of fluid delivered by said pump; second passage means communicating at one end with said first passage means between said control valve and the cylinder bore of said one piston and at the other end with a space at atmospheric pressure; a throttle in said second passage means; and a further passage means connecting the cylinder bore of the other of said pistons with the outlet of the pump.

3,969,039

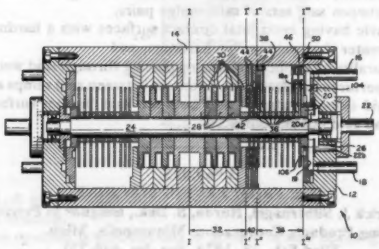
VACUUM PUMP

Kenneth R. Shoulders, Woodside, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1974, Ser. No. 494,016

Int. Cl.² F04D 19/04

U.S. Cl. 417—244 **4 Claims**



1. An integral vacuum pump for evacuating a fluid, such as air, from a sealed chamber as in a scientific instrument of the type of an electron microscope comprising:

a housing having an inlet to be connected in sealed relation to said chamber and an exhaust at an opposite end thereof;

a shaft axially disposed in said housing;

motor means for providing rotary motion to said shaft;

axial flow turbomolecular pumping means disposed in said housing, adjacent said inlet, and alternately including stators fixedly secured to said housing and rotors fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators to provide turbomolecular pumping;

centrifugal compressor pumping means disposed in said housing intermediate said axial flow turbomolecular pumping means and said exhaust, including stators fixedly secured to said housing and rotor fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators to provide centrifugal compressor pumping;

fluid diode pumping means disposed in said housing intermediate said centrifugal compressor pumping means and said exhaust including stators fixedly secured to said housing and rotors fixedly secured to said shaft, said rotors being in juxtaposed relation to said stators.

3,969,040

PUMP, ESPECIALLY CIRCULATING PUMP

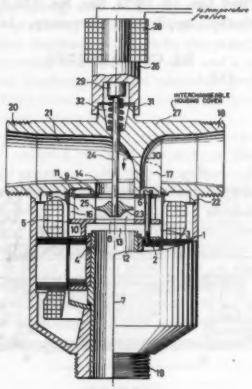
Falko Hamm, Stuttgart, and Günter Kratz, Plochingen, both of Germany, assignors to G. Bauknecht Gesellschaft mit beschrankter Haftung Electrotechnische Fabriken, Stuttgart, Germany

Filed Aug. 22, 1974, Ser. No. 499,566

Claims priority, application Germany, Aug. 23, 1973, 2342605

Int. Cl.² F04B *49/00*

U.S. Cl. 417—292 **10 Claims**



1. A pump, especially circulating pump, which includes: housing means; a pump wheel rotatably but non-displaceably arranged within said housing means: said housing means comprising two suction chambers arranged in axial direction of said pump wheel and respectively located on opposite sides of said pump wheel, said housing means also comprising at least one pressure chamber extending around said pump wheel and its axis of rotation; said pump wheel having two suction openings located in the vicinity of the axis of rotation of said pump wheel and at opposite sides thereof while communicating with the respective adjacent suction chamber; said pump wheel also comprising vanes extending radially with regard to said axis of rotation of said pump wheel and also comprising a substantially central fluid receiving chamber establishing fluid communication between said two suction openings and adapted to convey fluid to said vanes; and a control member having a circumferential contour and size approximately corresponding to the circumferential contour and size of said suction openings and being displaceable in a continuous manner in said fluid receiving chamber in the axial direction of said pump wheel for controlling the inflow of fluid from said suction chambers through the respective suction openings into said fluid receiving chamber, a plug axle arranged in said housing means and having an axial bore with an outer mouth for connection to a fluid supply and with an inner mouth leading to one of said suction chambers.

3,969,041

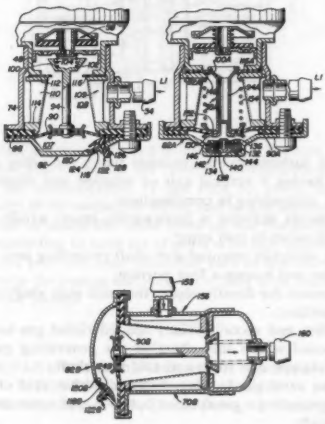
SHUT-OFF VALVE FOR AUTOMOTIVE FUEL FLOW

Heinrich E. Thausing, St. Louis, Mo., and Roger G. Wallis, Belleville, Ill., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,912

Int. Cl.² F04B *49/10*

U.S. Cl. 417—295 **8 Claims**



1. In a fuel system the combination of a shut-off valve and a fuel pump, said shut-off valve structure being positioned in the feed line of an automotive vehicle between the fuel supply and the inlet valve of said fuel pump comprising an outer circumferential housing, a cap secured adjacent an end of said housing, a flexible diaphragm secured between the cap and housing to define an air chamber between the cap and one side of the diaphragm and a fuel chamber adjacent the other side of the diaphragm, a fuel inlet extending through the housing and in fluid communication with the fuel chamber, a shut-off valve member connected to the diaphragm for movement therewith and an outlet for the fuel chamber receiving the valve member for movement between open and closed positions relative to the outlet, said cap having a vent opening therein to permit the bleeding in and exhaust of air from the air chamber, and a vent valve structure on the cap adjacent the vent opening for controlling the flow of air through the vent opening, said vent valve structure providing a relatively fast rate of air flow within the air chamber during movement of the diaphragm and shut-off valve member toward an open position and providing a relatively slow rate of air flow from the air chamber during movement of the diaphragm and shut-off valve member toward a closed position.

3,969,042

TURBOMOLECULAR VACUUM PUMP HAVING A GAS BEARING-SUPPORTED ROTOR

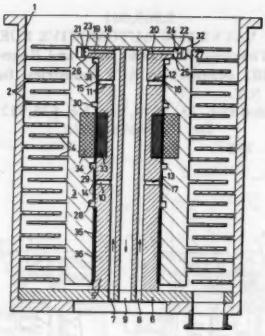
Werner Bächler, Hoffnungsthal, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Nov. 25, 1974, Ser. No. 526,979

Claims priority, application Germany, Nov. 29, 1973, 2359456

Int. Cl.² F04B 35/04; F04D 29/20; F03B 5/00

U.S. Cl. 417—354 8 Claims



1. A turbomolecular vacuum pump including a stator; a rotor having a vertical axis of rotation and disposed in the stator, comprising in combination:

a. means defining a downwardly open, axially extending chamber in said rotor;

b. a vertically oriented stub shaft projecting into said chamber and having a foot portion;

c. means for fixedly supporting said stub shaft at said foot portion;

d. first and second axially spaced radial gas bearings disposed within said chamber for generating gas cushions between said rotor and said stub shaft;

e. an axial gas bearing disposed within said chamber for generating a gas cushion between said rotor and said stub shaft;

f. means defining gas intake and gas outlet channels in said stub shaft for supplying gas to and withdrawing gas from said axial and radial gas bearings; and

g. an electric motor of the outer runner type disposed between the two radial gas bearings and connected to said rotor.

3,969,043

PROCESS COOLED SUBMERSIBLE PUMP AND MOTOR ASSEMBLY

Hugh H. Bright, Oklahoma City; Lee W. Davis, Del City, and Frank J. Stanaszek, Bethany, all of Okla., assignors to Little Giant Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 430,657, Jan. 4, 1974, abandoned. This application Mar. 25, 1974, Ser. No. 454,254

Int. Cl.² F04B 39/06

U.S. Cl. 417—366 23 Claims

1. A pump and motor assembly, comprising:

a housing assembly;

a first bearing securedly connected to said housing assembly;

a self aligning second bearing adjustably connected to said housing assembly and held in spatial relationship to said first bearing;

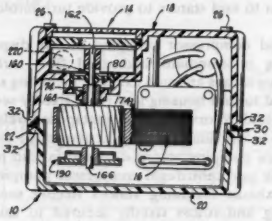
a drive shaft rotatingly held by said first and second bearings;

a volume chamber having a volute wall extending into said housing assembly;

an impeller disposed within said volume chamber and connected to said drive shaft;

motor means for rotating said drive shaft;

seal means for providing a seal between said volume chamber and said drive shaft;



inlet port means for providing fluid communication with said volume chamber; and,

outlet port means for providing fluid communication with the volume chamber at a location removed from said inlet port means.

3,969,044

FUEL PUMP ASSEMBLY

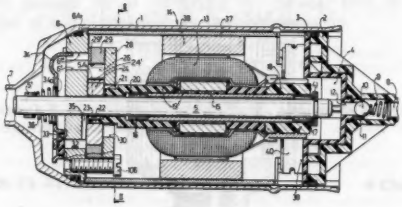
Paul Füssner, Sindelfingen, and Horst Salmanzig, Ludwigsburg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 18, 1974, Ser. No. 434,575

Claims priority, application Germany, Jan. 26, 1973, 2303687

Int. Cl.² F04B 17/00

U.S. Cl. 417—410 11 Claims

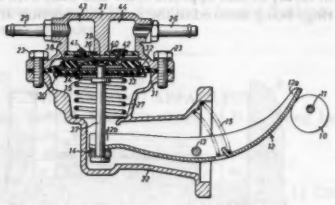


1. In an apparatus for conveying a liquid, particularly fuel, a combination comprising a housing having a liquid admitting inlet and a liquid discharging outlet; a shaft fixedly mounted in said housing; an electric motor installed in said housing and including a first rotor mounted on and rotatable relative to said shaft; a pump installed in said housing and having a second rotor mounted on and rotatable relative to said shaft to thereby cause a liquid to flow from said inlet to said outlet, said second rotor having five axially extending sockets; said first rotor comprising a cylindrical extension extending short of said second rotor; and elastic torque-transmitting means connecting said rotors and comprising five discrete complementary projections for each of said sockets each projecting in axial direction from said cylindrical extension into each of said respective sockets of said second rotor.

3,969,045
DIAPHRAGM VACUUM PUMP FOR VEHICLES

Toshimitsu Sakai; Tadashi Saito, both of Toyota, and Isamu Suzuki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Obu, both of, Japan

Filed Dec. 16, 1974, Ser. No. 533,216
Claims priority, application Japan, Dec. 28, 1973, 48-1957
Int. Cl.[2] F04B 39/00; F01B 11/02
U.S. Cl. 417—471 4 Claims



1. In a diaphragm vacuum pump for a vehicle, comprising a pump housing mounted on a body portion of the vehicle and including thereon an inlet port connected to a pneumatically operated device and an exhaust port connected to the atmosphere; a diaphragm piston assembly hermetically assembled within said housing for forming a pressure reduction chamber at one side thereof, said chamber being connected respectively with said inlet and exhaust ports; valve means assembled within said chamber and including a suction valve to suck the air from said pneumatically operated device into said chamber through said inlet port and an exhaust valve to discharge the sucked air externally through said exhaust port; an operation rod for reciprocating said diaphragm piston assembly for subsequently producing vacuum in said pressure reduction chamber; a drive mechanism driven by the prime engine of the vehicle for operating said operation rod; and a resilient means for biasing said diaphragm piston assembly to its upper dead point against the operation torque from said drive mechanism by way of said operating rod,

the improvement wherein a resilient cushion material is integrally secured on said diaphragm piston assembly within said pressure reduction chamber and between said diaphragm piston assembly and said valve means to constantly minimize the volume of said chamber when said diaphragm piston assembly reaches its upper dead point and to absorb touching pressure against said valve means, and said resilient cushion material is an elastic synthetic resin member of predetermined thickness with a cross-section corresponding with the shape of the inner wall facing said diaphragm piston assembly within said pressure reduction chamber.

3,969,046
METERING PUMP SYSTEM

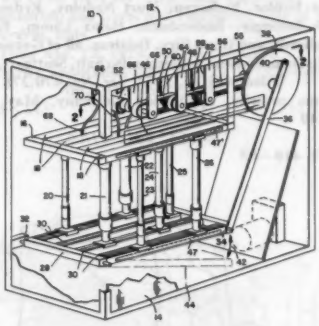
James M. Wynn, 1137 Walpert No. 18, Hayward, Calif. 94541

Filed July 12, 1974, Ser. No. 487,960
Int. Cl.[2] F04B 17/00, 15/00, 23/06
U.S. Cl. 417—517 12 Claims

1. A system for metering and pumping a plurality of fluids, said system comprising:

a pumping stage including a plurality of piston pumps extending from a substantially rigid support to a rack hinged at one end and having an opposite free end, each pump associated with one of the respective fluids, each said pump having an expansion cycle for drawing a preselected amount of fluid into the pump and a contraction cycle for pumping the fluid, the amount of fluid drawn into each of the pumps during the expansion cycle depending on the distance of the different pumps from the hinged end of the rack;

a valve stage comprising a valve body having a plurality of sets of externally opening ports communicating with a central passageway, each set including an inlet port, an outlet port generally opposed to the inlet port and a common port connected to one of the respective pumps, and a valve spool rotatably mounted within the passageway and having a flat portion corresponding to the inlet and outlet ports of each said set of ports and a circumferential indentation corresponding to the common port of each set and integral to the flat portion corresponding therewith; and

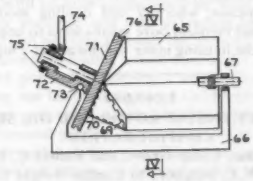


power supply means adapted to reciprocate the free end of the rack and to operate the valve stage in synchronization with the reciprocation of the rack to pump metered amounts of the respective fluids, said power supply means adapted to rotate the valve spool so that the flat portion corresponding to each set of ports is serially aligned with the inlet port and then the outlet port to first allow fluid to pass to the pumps and then allow fluid to be discharged from the pumps.

3,969,047
ROTARY FLUID DEVICE WITH PIVOTED WEDGE-SHAPED RADIAL VANES

Peder S. Mortensen, Box 396, Sunset Drive, Hudson, Quebec, Canada

Division of Ser. No. 294,517, Oct. 3, 1972, abandoned. This application Oct. 17, 1974, Ser. No. 515,461
Int. Cl.[2] F01C 1/00, 21/16; F04C 17/00, 29/10
U.S. Cl. 418—18 2 Claims



1. A device to displace fluids and to change the volume and pressure of compressible fluids comprising a number of vanes extending radially outwards from a hinge line and pivoted so that their circumferential spacing can be varied;

the vanes having a wedge shaped cross section substantially in the configuration of a sector of a circle;

a structure supporting said vane assembly so that it can revolve about an axis coinciding with the hinge line;

same structure also supporting a vane governing rotator at least at one end of the vane assembly, governing the

variation of the circumferential spacing of the vanes as the vane assembly revolves;

said vane governing rotator comprising a wheel which can revolve about an axis intersecting the hinge line at an angle;

the end of each vane having a pivotally attached connecting panel the other end of which is pivotally attached to the wheel along a radial line.

3,969,048

ROTARY PISTON INTERNAL COMBUSTION ENGINE OF TROCHOIDAL CONSTRUCTION

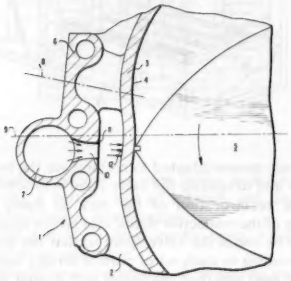
Helmut Dobler, Esslingen; Kurt Nadolny, Erdmannhausen; Karl Zeilinger, Endersbach; Heinz Lamm, Esslingen-St. Bernhardt, and Horst Piry, Deizisau, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed May 15, 1974, Ser. No. 470,278

Claims priority, application Germany, May 18, 1973, 2325249

Int. Cl.² F01C *21/06*

U.S. Cl. 418—83 **7 Claims**



1. A rotary piston internal combustion engine of trochoidal construction, which includes a housing casing means, provided with hollow space means disposed between the housing inner and housing outer wall means for a cooling medium, the outer wall means including a cooling medium channel means, and a polygonal piston means rotating within the housing casing means and sliding along the inner wall means, characterized in that at least one cooling medium bore means in communication with the cooling medium channel means, is arranged in the housing outer wall means, the cooling medium bore means being directed toward the hottest area of the housing inner wall means, the cooling medium bore means being constructed as a conically shaped nozzle having its narrowest cross-section at the end thereof opening into said hollow space means, whereby said cooling medium is discharged from said medium bore means so as to impinge at said hottest area of the housing inner wall means at a high velocity.

3,969,049

ROTARY ENGINE ROTOR AND OIL SEAL CONFIGURATION

Walter L. Hermes, Cedar Grove, and Robert C. Davis, Ramsey, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed July 17, 1975, Ser. No. 596,728

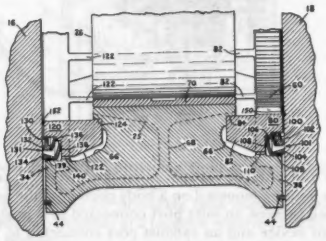
Int. Cl.² F01C *21/08*, *19/08*

U.S. Cl. 418—91 **9 Claims**

1. A composite rotor for a rotary mechanism including a housing having a pair of axially-spaced end walls and a peripheral wall between said end walls to form a cavity therebetween and a shaft coaxial with said cavity and having an eccentric portion disposed within said cavity and upon which said rotor is journaled for relative rotation and for cooperation with the inner multi-lobe surface of said peripheral wall to form a plurality of working chambers between said rotor and peripheral wall surface, said composite rotor comprising:

a. a main rotor portion having a peripheral wall, a pair of axially-spaced end walls at opposite sides of said rotor and extending radially inwardly from said peripheral wall, a hub portion and a plurality of circumferentially-spaced partitions interconnecting said hub portion with said end walls and peripheral wall and dividing the interior of the rotor into a plurality of circumferentially-spaced compartments;

b. a pair of rings coaxially disposed adjacent to and radially inwardly of said opposite rotor end walls with each of said rings being secured to the rotor hub portion at circumferentially-spaced points to leave a substantial annular gap between said ring and the adjacent end of the rotor hub portion and with one of said rings having internal gear teeth formed thereon, each of said rings having circumferentially-spaced ribs extending axially inwardly across said annular gap and disposed in alignment with said rotor partitions;



c. seal means disposed between the radially facing surfaces of each of said rings and the adjacent rotor end wall for sealing cooperation with the adjacent housing end wall; and

d. means for supplying cooling oil to said rotor compartments for drainage through said annular gaps at each side of the rotor hub portion.

3,969,050

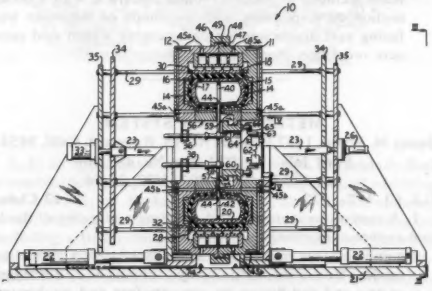
VERTICAL CURING MOLD FOR TUBE-TIRES

Arlynn Wesley Anderson, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 23, 1975, Ser. No. 589,169

Int. Cl.² B29B *5/02*

U.S. Cl. 425—40 **5 Claims**



1. A tube-tire curing apparatus useful for curing a vertically positioned tube-tire, comprising:

a rigid tire restrainer ring fittable in mating relation about the outer circumference of an uncured tube-tire;

a mold comprising a pair of vertically disposed opposing generally circular mold members defining when moved together a cavity therebetween adapted to mateably hold

said tube-tire and including a tire side mating portion and a tire inner circumference mating portion;

means for moving at least one of said mold members towards and away from the other;

means communicating with each of said mold members for supportingly engaging said restrainer rings;

means communicating with each of said mold members for sealingly abutting against a respective adjacent edge of said restrainer ring;

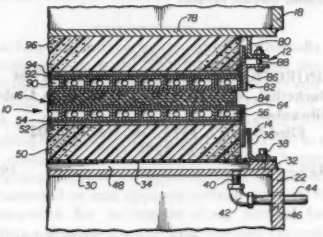
means for retracting and extending said abutting means responsive to expansion and contraction of said restrainer ring; and

means within said mold for directing a heated fluid into and out of said tube-tire.

3,969,051
VULCANIZING APPARATUS

Harry Hovila, Bothell, Wash., assignor to D.G. Rung Industries, Inc., Seattle, Wash.

Filed June 13, 1975, Ser. No. 586,818
Int. Cl.² B29D *29/04*
U.S. Cl. 425—11 **11 Claims**



1. A vulcanizing apparatus comprising:

a. a first platen assembly including

1. a first frame member; and

2. first means forming a first platen surface, said first means being fixed to said first frame member,

b. a second platen assembly including

1. a second frame member,

2. second means forming a second platen surface, said second means being associated with said second platen assembly for movement toward and away from said second frame member in a direction generally transverse to said second platen surface,

3. a flexible diaphragm associated with said second frame member, said diaphragm being spaced therefrom and being substantially coextensive with said second platen surface, said diaphragm having a periphery,

4. third means affixing the periphery of said diaphragm to said second frame member, said diaphragm and said second frame member being so constructed as to form a fluid chamber between a first surface of said diaphragm and said second frame member,

5. heat exchange means for cooling said second platen surface, said heat exchange means having a heat transfer surface that is substantially coextensive with said second platen surface,

6. heating means forming a heat transfer surface substantially coextensive with said second platen surface,

7. insulating means forming a layer of insulation interposed between said diaphragm and said second means, said heating means and said heat exchange means being sandwiched between said insulating means and said second means,

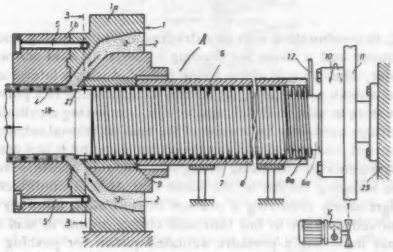
c. fourth means removably coupling said first and second platen assemblies so as to orient said first and second platens surfaces in generally parallel, spaced, mutually opposing relationship, and

d. fifth means associated with said second platen assembly for admitting and exhausting fluid from said chamber for increasing and decreasing the fluid pressure in said chamber to move said diaphragm relative to said second frame member and to thereby move said second platen surface toward and away from said platen surface.

3,969,052
PROCESS OF THE MAKING OF EXTRUDED THERMOPLASTIC BODIES AND DEVICE FOR THE CARRYING OUT OF THE SAID PROCESS

Ariberto Tamborini, and Giancarlo Tamborini, both of Via 25 Aprile, Daverio, Italy

Filed Apr. 12, 1974, Ser. No. 460,378
Claims priority, application Italy, May 29, 1973, 24685/73
Int. Cl.² F16L *11/08*
U.S. Cl. 425—113 **11 Claims**



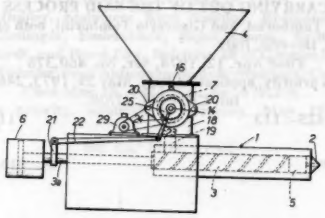
1. A device for embedding an elongated helically shaped reinforcing element within a molded thermoplastic body of annular cross section comprising an extrusion head having a forward portion and a rearward portion, a source of thermoplastic material, said extrusion head rearward portion having a feed duct with an inlet communicating with said source of thermoplastic material, said duct extending through said extrusion head and opening through the forward portion of the inner face thereof providing a feed duct outlet, said extrusion head forward portion embodying a longitudinally extending, annular sizing run having a rearward end communicating with said feed duct outlet, means provided internally of said extrusion head rearward portion, rearwardly of said sizing run and said feed duct outlet, defining an annular passage coaxial with said sizing run, but having a cross section less than that of said sizing run, said annular passage having a forward outlet end communicating with the rearward end of said sizing run substantially at the confluence of the latter with said feed duct outlet, means provided rearwardly of said annular passage and communicating with same at its rearward outlet carrying a supply of said reinforcing element, and means for advancing said supply carrying means whereby said reinforcing element is introduced into said passage, forced therethrough, and thence forced into said sizing run whereby in view of the coaxiality of said annular passage and said sizing run said reinforcing element is centered within said sizing run.

3,969,053

DEVICE FOR DISTRIBUTING DYESTUFFS OR OTHER ADDITIONAL MATERIALS IN EXTRUDERS OR THE LIKE

Emile Felix Baconnier, Route d'Arlix, 07600 Vals, and Francois Delicheres, Quartier des Bastides, 07200 Aubenas, both of France

Filed Dec. 4, 1974, Ser. No. 529,506
Claims priority, application France, Dec. 7, 1973, 73.43726
Int. Cl.[2] B29F 3/00
U.S. Cl. 425—132 8 Claims



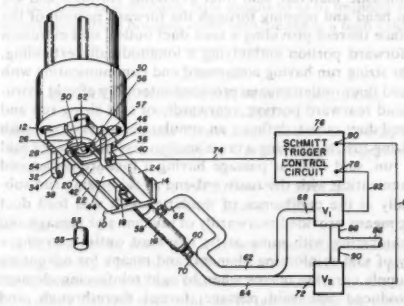
1. In combination with an extruding machine having a screw extruder and a chute for feeding material to said screw extruder, wherein said chute being provided with a lateral aperture; a device for adding an additional substance in a pulverulent state to said material, said device comprising a cylindrical cartridge container for a mass of the said additional substance; means at one end of said container for securing it in a removable manner to said chute in register with said aperture; rotatable scraping means at the same end of said container for progressively removing a portion of said mass allowing said removed portion to fall into said chute; means in said container including a pressure actuated piston for pushing said mass towards said scraping means; means for rotating said scraping means; and transmission means between said screw extruder and said rotating means for communicating to said scraping means a rotational movement proportional to the axial movement of the extruder screw.

3,969,054

LENGTH SENSING SINGLE STRAND SHUTTLE CUTTER APPARATUS FOR CUTTING PROPELLANT GRAIN

Asa E. Roane, Blacksburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,192
Int. Cl.[2] B26D 3/20, 5/12, 5/38
U.S. Cl. 425—142 5 Claims



1. A length sensing single strand shuttle cutter apparatus for cutting substantially uniform propellant grain lengths from a variable rate continuously extruded propellant mixture which comprises:

a slide housing having a bifurcated front end, a rear end, side walls having longitudinally positioned parallel spaced slide grooves therein, a pair of downwardly protruding housing length-positioning bosses, and an agate bore positioned in said birfurcated front end intermediate said bosses;

an agate fixedly positioned in said agate bore, said agate having a die orifice therein which is axially in line with and intermediate said bosses;

cutter means slidably positioned in said slide grooves for repetitively and uniformly cutting said propellant grain lengths from said extruded propellant mixture;

optical means for sensing the leading edge of said extruded propellant mixture and generating an output signal in response to the passage of said leading edge in front of said optical means;

electronic circuit means electrically coupled to and responsive to said optical means for alternately generating output signals to first and second output terminals; and

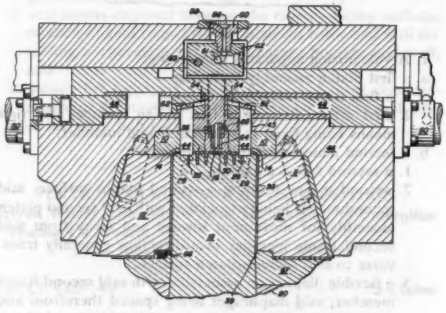
pneumatic means for reciprocating said cutter means in said slide grooves in response to said output signals from said electronic circuit means.

3,969,055

INJECTION MOLD CONTROL SYSTEM

Paul J. Buckethal, Villa Hills, Ky., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Dec. 17, 1973, Ser. No. 425,302
Int. Cl.[2] B29F 1/06
U.S. Cl. 425—145 16 Claims



1. In an injection-molding apparatus for repetitively forming a molded article, said apparatus having surfaces defining a cavity and at least two openings for the injection of material into said cavity to form said molded article, the improvement which comprises:

a. a plurality of sensing means forming part of said surfaces, said sensing means being spaced apart from one another and being spaced from said openings, each of said sensing means developing an indication of the arrival of said material thereat and thus the respective flow rate of said material through each of said openings into said cavity and of unbalanced flow conditions of the material injected into said cavity while forming said article;

b. control means for measuring the time between the arrival of material at the respective sensing means; and

c. regulating means for adjusting in response to a differential time indication from said control means the relative amounts of material passing through each of said openings into said cavity while forming a subsequent article.

3,969,056

MACHINE FOR SURFACE TREATMENT OF CONCRETE PANELS OR SECTIONS

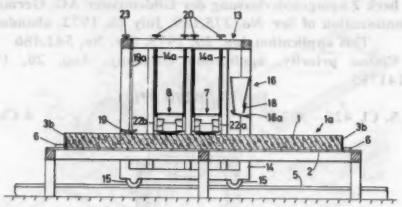
Rasmus Andreas Larsen, Rungsted Kyst, and Axel Nielsen, Copenhagen, both of Denmark, assignors to Larsen & Nielsen Enterprise A/S, Birkerod, Denmark

Continuation-in-part of Ser. No. 232,547, March 7, 1972. This application Feb. 5, 1975, Ser. No. 547,307

Claims priority, application Denmark, Mar. 9, 1971, 1086/71

Int. Cl.² B28B *17/00*

U.S. Cl. 425—218 9 Claims



1. Machine for surface treatment of horizontally cast concrete units, such as walls, partitions, and floor decks, which are used in the erection of prefabricated houses and which are cast in mold frames having lateral boundaries, the top edges of which are flush with the upper surface of the concrete unit, the finishing being performed while the units rest in their mold frames, comprising a horizontal rectangular framework, opposed vertical supports on opposite sides of said framework, wheels mounted on said opposed vertical supports for guiding said framework for movement along parallel longitudinal tracks disposed under each of said opposed vertical supports, vertically adjustable transverse support means extending between said vertical supports, a plurality of pairs of rollers, the rollers of each pair being mounted at opposite ends of said vertically adjustable transverse support means, a plurality of parallel endless belts, each of said belts passing over one of said pairs of rollers, means mounted on said machine for driving said belts in mutually opposite directions, a mold frame mounted beneath said horizontal framework for containing a cast concrete unit to be finished, sides on said mold frame parallel to said vertical supports, said mold frame sides having a width greater than the cast concrete unit, each said belt having a lower run and an upper run, said lower run spanning at least the entire width between said mold frame sides and overlying the surface of the cast concrete unit, a plurality of support plate means mounted on said framework, each of said support plate means positioned above and in contact with the lower run of an endless belt to direct the respective said belt downward against the surface of the cast concrete unit, and separately driven means connected to each of said support plate means for vibrating the respective support plate means substantially perpendicular to the surface of the cast concrete unit.

3,969,057

PRESS FOR MOULDING GRAMOPHONE RECORDS AND THE LIKE

Marcel J. Pierre, Cheptainville, France, assignor to Societe Materiel pour Toutes Applications Plastiques - M.A.P., Paris, France

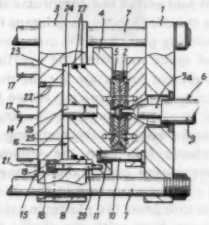
Filed Feb. 10, 1975, Ser. No. 548,752

Claims priority, application France, Feb. 21, 1974, 74.05980

Int. Cl.² B29F *1/00*; B29H *3/08*

U.S. Cl. 425—242 R 4 Claims

1. Press for moulding gramophone disc records, comprising: a fixed press platen adapted to carry a first mould element; parallel guide columns fast with the fixed press platen; a movable press platen mounted on and movable relatively to said columns; a movable intermediate platen adapted to carry a second mould element, said first and second mould elements having cavities which together form the shape of a gramophone disc record, the movable press and intermediate platens co-operating one within the other as an arrangement of a piston in a cylinder with the intermediate platen supported wholly by the movable press platen; means including a constant-stroke closing mechanism of the toggle type for moving the movable press platen along the guide columns, between an operative position close to the fixed press platen and an inoperative position remote from the fixed press platen; a circuit for the admission of fluid under pressure between the movable press and intermediate platens to effect relative movement of the piston of said piston and cylinder arrangement out of its cylinder; and a feed system for plastics material in the fluid state capable of introducing under pressure a metered charge of this plastics material between the two mould elements when



the movable press platen occupies its operative position and when the said circuit delivers fluid under pressure as aforesaid between the movable press and intermediate platens, said means for moving the movable press platen and the circuit for the admission of fluid under pressure being operable, after the movable platen has been moved toward the fixed platen by the constant stroke mechanism, to act upon the intermediate platen, on each operation of introduction of plastics material under pressure, in two successive stages, the first of which consists in driving the intermediate platen towards the fixed platen with a resilient force calibrated to a value lower than the opposing force which is produced by the introduction of the plastics material into the mould and which tends to separate the mould elements of the fixed and intermediate platens, and the second of which is a stage of compression with a force sufficient to move the two mould elements one against the other after introduction of the charge of plastics material.

3,969,058

APPARATUS FOR MAKING PLASTIC CONTAINERS

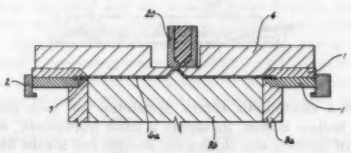
Brian Procter, Stroud, England, assignor to Hayssen Manufacturing Co., Sheboygan, Wis.

Division of Ser. No. 456,074, March 29, 1974, abandoned. This application Feb. 12, 1975, Ser. No. 549,280

Claims priority, application United Kingdom, Apr. 10, 1973, 17274/73

Int. Cl.² B29D *23/02*

U.S. Cl. 425—242 B 8 Claims



1. Apparatus for making plastic containers comprising means for first molding a pre-form and means for then molding the pre-form into a container having an open end, said pre-form molding means comprising a transfer means having

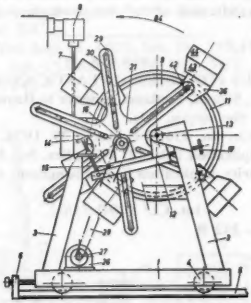
opposite sides, an aperture therethrough from one side to the other, and a groove formation surrounding the aperture adapted to receive plastic during the molding of the pre-form and defining the configuration for the open end of the container whereby said open end of the container is molded as an integral part of the pre-form when the pre-form is molded, said apparatus having a station for the molding of the pre-form, means at said station for closing the aperture in said transfer means comprising a metering plate on one side and a compression means on the other side of said transfer means at said station, said compression means comprising a compression ring and a compression piston movable in the compression ring, said compression ring having an end engageable with the said other side of the transfer means around said aperture at substantially the location of the groove formation in the transfer means, said compression ring being movable relative to the metering plate from an open position relative to the transfer means and the metering plate and a closed position wherein said end of the compression ring engages said other side of the transfer means and clamps the transfer means between the metering plate and the compression ring thereby to form a closed space including the aperture in the transfer means and said groove formation for the molding of the pre-form, said metering plate having a passage for flow of plastic into said closed space, means for delivering into said closed space through said passage in the metering plate a volume of thermoplastic plastic less than the volume of said closed space, said compression piston then being movable in and relative to said compression ring in the direction toward the metering plate to compress the plastic in said closed space and form it into the pre-form with the plastic filling said groove formation thereby to mold the open end of the container which is to be formed from said pre-form as an integral part of the pre-form and also to retain the pre-form in the transfer means.

3,969,059

CONTINUOUS ROTARY APPARATUS FOR BLOW-MOLDING PLASTIC HOLLOW BODIES

Edmond Michel, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed June 25, 1974, Ser. No. 483,071
Claims priority, application France, July 6, 1973, 73.25153
Int. Cl.² B29C *5/06*
U.S. Cl. 425—342 **11 Claims**



1. In a continuous rotary apparatus for blow-moulding plastic hollow bodies, including a fixed framework, moulds, means of opening and closing the moulds and means for introducing a blowing fluid, the improvement comprising:

a. a fixed track which is integral with the framework;

b. a plurality of independent moveable moulding units which carry the moulds, and travel successively over the track; and

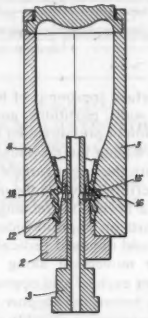
c. a device for driving the moulding units, which includes a rotary platen mounted on a shaft, said shaft being moveable relative to the fixed framework and said platen being equipped with equidistant slots which act on the drive devices of the moulding units.

3,969,060

APPARATUS FOR DEFORMING A TUBULAR SLUG OF THERMOPLASTIC MATERIAL

Otto Rosenkranz; Karl-Heinrich Seifert, and Claus Horwege, all of Hamburg, Germany, assignors to Heidenreich & Harbeck Zweigniederlassung der Gildemeister AG, Germany

Continuation of Ser. No. 275,139, July 26, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,486
Claims priority, application Germany, Aug. 20, 1971, 2141755
Int. Cl.² B29D *23/03*
U.S. Cl. 425—387 B **4 Claims**



1. An apparatus for forming a blown plastic article from an elongated, essentially tubular parison having a longitudinal axis, said parison having one longitudinal portion destined to be blown to the configuration of the blown body portion of said article and a second longitudinal portion destined to form a profiled finish portion of the plastic article, comprising:

a first mold member including an essentially cylindrical core axially insertable into said second parison portion, and an annular shoulder for engaging the annular end of said parison adjacent said second parison portion, said core having generally radial openings therein to receive fluid under pressure;

a sectional blow mold closable onto said parison with said first mold member inserted in said parison, the sections of said blow mold in the displace position defining (a) a blow molding cavity corresponding to the configuration of said article blown body portion, (b) a profiled finish region adjacent the second portion of said parison, and (c) an annular restricting ring between said molding cavity and said finish region, said restricting ring extending radially inwardly and having a diameter less than the corresponding outer diameter of the parison to grip the parison between said molding cavity and the finish region and between said cylindrical core and said restricting ring;

means for displacing said first mold member axially of said parison toward said blow molding cavity to diaplace the annular end of said parison axially toward said profiled finish region by said annular shoulder and to displace at least a portion of said second parison portion radially outwardly into said profiled finish region of the mold; and

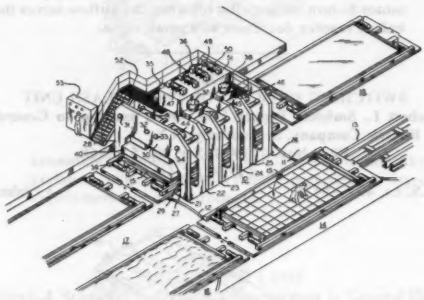
means for supplying air under pressure through the radial openings in said core to assist in displacing the plastic material of said second parison portion radially outwardly into said profiled finish region.

3,969,061

CONCRETE PRESS WITH MOLD CLAMPING MEANS

Howard M. Fisher, and Bernd G. Albers, both of New Castle, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 225,575, Feb. 11, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,455
Int. Cl.[2] B28B 3/00
U.S. Cl. 425—423 10 Claims



1. A press for making articles from a high water-to-cement ratio concrete slurry, said press comprising a plurality of spaced apart, generally vertically oriented frame means disposed adjacent the opposite sides of and defining a platen receiving space,

upper and lower platen means disposed within said space in generally parallel spaced apart relation, said lower platen means being constructed and arranged to support a concrete containing mold having sides presented toward the frame means on the opposite sides of said space,

first force producing means coupled to one of said platen means for moving the same toward the other of said platen means thereby to compress the concrete in said mold,

a plurality of wedge means, at least one of said wedge means being disposed between each of the sides of said mold and said frame means disposed on each of the sides of said space, each of said wedge means being mounted for generally vertical movement into and out of high pressure wedging engagement between the respectve sides of said mold and said spaced apart frame means on the opposite sides thereof for exerting a force inwardly toward said mold in opposition to the forces tending to deform the mold laterally as said mold is compressed between said platen means,

selectively operable force producing means for selectively moving each of said wedge means vertically on said frame means and into and out of high pressure engagement with the adjacent side of said mold,

means for conveying said mold into and out of said space through the ends of said frame means, pivotally mounted clamping means positioned adjacent the path of said mold and each of the ends of said mold,

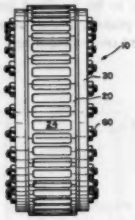
and third force producing means operatively connected to said clamping means for selectively pivoting said clamping means out of said mold path and into said path for exerting a longitudinal clamping force on the ends of said mold and for moving said clamping means out of the path of said mold to permit insertion and withdrawal thereof.

3,969,062

BRIQUETTING ROLL HAVING REMOVABLE MOLD SEGMENTS

Karl R. Komarek, Chicago, Ill., assignor to K. R. Komarek, Inc., Elk Grove Village, Ill.

Filed July 22, 1975, Ser. No. 598,056
Int. Cl.[2] B29C 1/00
U.S. Cl. 425—471 20 Claims



1. A briquetting roll comprising the combination of:

a. a central cylindrical core having two side walls, each of said side walls having core locking means for detachably connecting a retaining ring to said core;

b. a plurality of mold segments around the periphery of said core, each of said mold segments comprising:

1. a top working surface;

2. a bottom surface opposite said top surface;

3. two opposite end walls connecting said top working surface and said bottom surface, said end walls diverging with respect to each other relative to said bottom surface; and

4. two opposite side walls connecting said top working surface and said bottom surface, each of said side walls having at least one hole therein;

c. two annular retaining rings, one on each side of said central core, each spanning the interface between said mold segments and said central core, with each of said retaining rings having a plurality of pins engaging the holes in said side walls of said mold segments and an inner locking means for engaging said core locking means; and

d. means for drawing the two annular retaining rings toward each other thereby affixing said mold segments to said central core.

3,969,063

APPARATUS FOR MANUFACTURING A PLASTIC NAME TAG HOLDER

Edward Dantowitz, Chestnut Hill, Mass., assignor to Albany Novelty Mfg. Co., Boston, Mass.

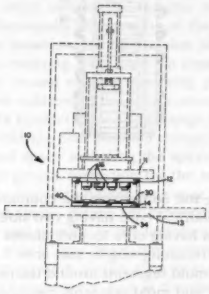
Filed June 12, 1975, Ser. No. 586,508
Int. Cl.[2] B29C 17/00, 27/00
U.S. Cl. 425—520 6 Claims

1. For use with a dielectric sealing machine, apparatus for sealing plastic name tag holders and the like comprising:

a. an upper platen having at least one electrically energized substantially U-shaped hollow electrode die secured to its lower surface, said die having a downwardly extending outer periphery terminating in a horizontal substantially U-shaped lower cutting edge, said die also having a downwardly extending inner periphery terminating in a horizontal substantially U-shaped lower sealing edge, the plane of said cutting edge being disposed below the plane of said sealing edge;

b. compression means secured to the lower surface of said upper platen within said hollow die, said compression means having a lower substantially horizontal bearing surface which, in its uncompressed condition, is disposed below the horizontal plane of said cutting edge of said outer periphery; and

c. a lower platen underlying said upper platen, said lower platen having a male mold assembly secured to its upper surface, said male mold assembly having at least one substantially planar insert finger having a substantially U-shaped perimeter, said insert finger being slightly narrower than said electrode die, said insert finger being normally positioned horizontally in telescopic registration beneath said electrode die, said insert finger being movably attached to said mold assembly to permit a bottom sheet of plastic to be inserted between said insert finger and said lower platen, and to permit a top sheet of plastic to be positioned over said insert finger;



d. said upper platen being lowered by said dielectric sealing machine to cause said compression means and said die to contact the top plastic sheet, said compression means urging the top plastic sheet into a horizontal plane against said insert finger, said substantially U-shaped sealing edge drawing the top sheet down and electronically sealing it to the bottom plastic sheet beyond the perimeter of said insert finger, and said substantially U-shaped cutting edge cutting the sealed top and bottom sheets further beyond the perimeter of said insert finger, said upper platen being raised to permit the cut-off sheet waste to be stripped away and the completed name tag holder to be removed from said insert finger.

3,969,064

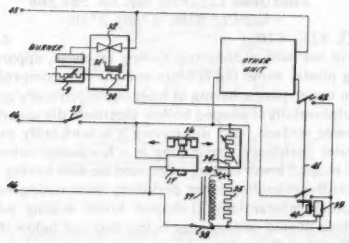
PROTECTION OF GAS BURNERS

Earle W. Ballentine, 3641 Via Palomina St., Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 518,473, Oct. 29, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,112

Int. Cl.² F23H *1/02*

U.S. Cl. 431—90 **1 Claim**



1. A burner for heating a cooking pan having a burner means, a combustion chamber above the burner means and an impeller driven by a motor for feeding air to the combustion chamber, an electrical control system for and connected to the motor, comprising:

ballast resistor means positioned in the stream of air flowing radially from the impeller means, one terminal of the ballast resistor means being connected to one side of the power line;

a fixed resistor connected to the other terminal of the ballast resistor;

relay means having a switch and a coil, the coil being connected to one terminal of a diode means, the other terminal of the diode means being connected to one terminal of the fixed resistor means, the relay being connected additionally to the other terminal of the fixed resistor means; and

the switch of the relay controlling the power supply to the motor to turn the impeller off when the airflow across the ballast resistor decreases to a small value.

3,969,065

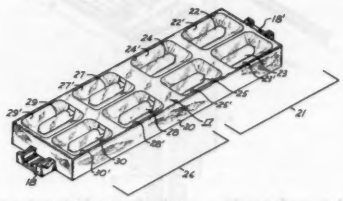
SWITCHING DEVICES FOR PHOTOFLASH UNIT

Robert L. Smialek, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,968

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 A **3 Claims**



1. A multilamp photoflash unit comprising:

a. a pair of flashlamps,

b. an electrical circuit into which said lamps are arranged to fire individually and in sequence, and

c. a solid state radiation switch located external of the lamps and forming part of said electrical circuit, said switch being located adjacent one of said flashlamps to receive radiant energy emitted by that flashlamp, said photoflash unit being characterized by said switch being a high relative humidity resistant mass of a material comprising a mixture of a solid copper salt of an organic acid, a humidity resistant organic polymer binder selected from the group consisting of cellulose esters, cellulose ethers, polyalkylacrylates, polyalkylmethacrylates, polystyrene, styrene copolymers, and polycarbonate, and which further contains a finely divided metal reducing agent.

3,969,066

SWITCHING DEVICES FOR PHOTOFLASH UNIT

Robert L. Smialek, Pepper Pike, and Mary S. Jaffe, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 5, 1974, Ser. No. 520,967

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 A **2 Claims**

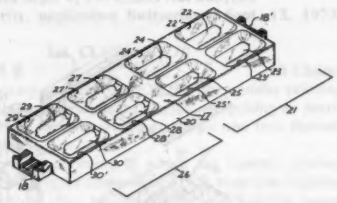
1. A multilamp photoflash unit comprising:

a. a pair of flashlamps,

b. an electrical circuit into which said lamps are arranged to fire individually and in sequence, and

c. a solid state radiation switch located external of the lamps and forming part of said electrical circuit with said switch being located adjacent one of said flashlamps to receive radiant energy emitted by that flashlamp, said photoflash unit being characterized by said switch being a high relative humidity resistant mass of a material comprising a

mixture of finely divided cupric oxide having an average particle size less than one micron with a humidity resistant organic polymer binder selected from the group consisting of cellulose esters, cellulose ethers, polyalkylacrylates, polyalkylmethacrylates, polystyrene, styrene copolymers and polycarbonate.



3,969,067

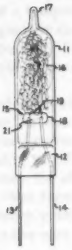
PHOTOFLASH LAMP

Lewis J. Schupp, Chesterland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,624

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 R **14 Claims**



1. A primer material for a high-voltage activated flashlamp which comprises a solid mixture of a combustible fuel, an oxidizer for said combustible fuel, a combustion-supporting oxide which is converted to a lower oxide upon combustion of the mixture and a small but effective amount of an alumina gel additive.

3,969,068

METHOD FOR COAL FIRING GLASS FURNACES

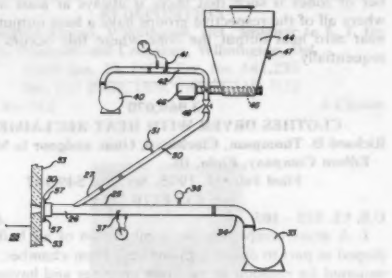
Karl A. Miller, Denver, and Clement V. Fogelberg, Arvada, both of Colo., assignors to Tusco Engineering Co., Inc., Commerce City, Colo.

Filed Dec. 16, 1974, Ser. No. 533,388

Int. Cl.² F27B *14/00*

U.S. Cl. 432—13 **7 Claims**

1. A method for producing molten glass from a glass batch comprising: placing a quantity of glass batch material in a glass tank furnace, and combusting fluidized, pulverous coal entrained in an airstream to produce a flame in the glass tank furnace immediately above the batch material and resulting molten glass, whereby glass is produced utilizing pulverized coal to direct fire the glass tank furnace.



3,969,069

BURNER SYSTEMS FOR OVENS AND METHODS OF OPERATING SUCH SYSTEMS

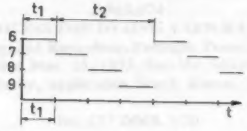
Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf-Heerdt, Germany

Filed Apr. 10, 1974, Ser. No. 459,687

Claims priority, application Germany, Apr. 14, 1973, 2318971

Int. Cl.² F27B *9/14;* **F27D** *7/00*

U.S. Cl. 432—25 **5 Claims**



1. A method of heating workpieces in ovens, comprising heating a workpiece which extends along at least one zone of an oven chamber by supplying heat to said zone from at least one burner nozzle; steadily controlling the temperature in said zone for a first time interval by thermostatically regulating the heat output from said nozzle during said first time interval in response to temperature variations in said zone; maintaining said heat ouput approximately constant at one of a plurality of magnitudes for a second time interval, said plurality of magnitudes including zero heat output; and repeating said regulating and maintaining operations in cycles having approximately a predetermined duration at heating loads corresponding to a predetermined percentage of the rated heating capacity for said nozzle, said zone being heated by a plurality of groups each of which comprises at least a single burner nozzle; and wherein each of said groups is subjected to said regulating and maintaining operations, said one zone communicating with at least one additional heating zone; and wherein each additional zone is heated similarly to said one zone and by a different plurality of groups, said zones each being heated by four heating groups; and wherein at heating loads less than about 12.5 percent of the rated heating capacity for the respective groups said second time interval includes a shorter interval which approximately equals three times said first time interval and a longer interval which approximately equals twice said shorter interval plus said first time interval, said one magni-

tude of heat output for each of said groups being at least near zero heat output during said shorter and longer intervals, and said groups being controlled so that said shorter and longer intervals alternate for each group and so that where the number of zones is such that there is always at least one zone where all of the respective groups have a heat output at least near zero heat output the zone where this occurs changes sequentially.

3,969,070

CLOTHES DRYER WITH HEAT RECLAIMER

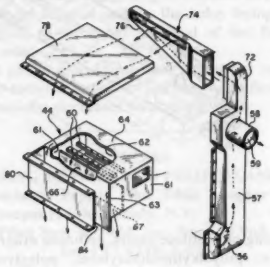
Richard D. Thompson, Cincinnati, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 12, 1975, Ser. No. 549,167

Int. Cl.[2] F27B 7/36

U.S. Cl. 432—105 **4 Claims**

1. A dryer comprising the combination of air baffle walls shaped in part to define a cylindrical drum chamber, a drum mounted for rotation in the drum chamber and having perforated cylindrical walls disposed in close proximity to the air baffle walls, a burner operable for combusting fuel with ambient air and a box shaped housing surrounding the burner and having wall structure for directing the combustion gases through an opening in one air baffle wall to the drum chamber, duct means for directing gases through an opening in the other air baffle wall from the drum chamber to the outdoor atmosphere, a tee connection in the duct means operable for diverting part of the gases therein for discharge other than to the outdoor atmosphere, a reclaiming housing having wall structure disposed in outwardly spaced adjacent relationship relative to the burner housing to define therebetween a tortuous passageway isolated from the combustion gases but in heat exchange relation therewith, manifold means for directing the diverted gases downstream of the tee to and only to the reclaiming housing passageway, said passageway wall structure terminating as an opening in the one air baffle wall immediately adjacent the opening therein for the combustion gases and downstream therefrom relative to the direction of rotation of the rotating drum and the burning housing and reclaiming housing wall structures including a common divider wall between said openings for the combustion gases and the diverted



gases, and the latter mentioned wall structures further including opposing outer faces disposed parallel to one another and to the common wall and terminating just short of the cylindrical drum wall and being disposed approximately normal thereto for providing a directional discharge of the gases for penetration into the drum interior and minimal side slip of the gases around the drum.

CHEMICAL

3,969,071

CARRIERS AND THEIR USE IN PRINTING AND DYEING

Bernard Hugelin, Gaillard, France, assignor to Sublistatic Holding S.A., Glaris, Switzerland

Filed Sept. 4, 1974, Ser. No. 503,163

Claims priority, application Switzerland, Sept. 13, 1973, 13176/73

Int. Cl.[2] D06P *3/70*

U.S. Cl. 8—2.5 R 12 Claims

1. In a temporary carrier for use in the dry transfer printing or dyeing process said temporary carrier comprising an inert, heat-resistant base sheet bearing on at least one face thereof a transfer coating

the improvement according to which the transfer coating comprises (a) a layer comprising (1) at least one cationic dyestuff which after reacting with an alkalizing agent passes into the vapor state at a temperature of from 160°C to 210°C and (2) a binder which upon drying forms a film sufficient to bond the dyestuff to the carrier base, which film is inert to the dyestuff and does not decompose under conditions of transfer, and (b) a layer comprising (1) an alkalizing agent which is capable of reacting with cationic dyestuff present in layer (a) to render said dyestuff vaporizable at a temperature of from 160°C to 210°C said agent being selected from the group consisting of an alkali or alkaline earth metal hydroxide, an alkali or alkaline earth metal alcoholate and an alkali or alkaline earth metal salt of a weak acid and (2) a binder which is stable to electrolytes, which upon drying forms a film which is inert to dyestuff present during transfer and which does not decompose under conditions of transfer.

12. In a method for the dry transfer printing or dyeing or organic material which comprises bringing into contact the surface of the organic material to be dyed or printeed and the transfer coated surface of a temporary carrier, subjecting the temporary carrier and organic material to heating at a temperature of about 160° to about 220° for a time sufficient to effect transfer and separating the organic material and temporary carrier,

the improvement according to which the organic material is a material which can be dyed or printed with cationic dyestuff, the temporary carrier is as defined in claim 1, and the time of heating to effect transfer is sufficient to permit reaction between the alkalizing agent and cationic dyestuff and for the thus formed vaporizable dyestuff to pass from the temporary carrier to the organic material and to penetrate into the said organic material.

3,969,072

PERPHTHALIC ACID AFTER-TREATMENT OF PHOSPHONATE FLAMEPROOFED FABRICS

Dudley K. Moses, Wadsworth, and George L. Brodmann, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1975, Ser. No. 600,993

Int. Cl.[2] D06L *3/02*; D06M *13/32*

U.S. Cl. 8—111 8 Claims

1. A method for removing discoloration from heat-cured phosphonate flameproofed substrate by contacting the substrate with a solution of perphthalic acid.

3,969,073

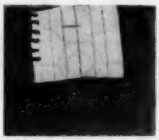
DRY CLEANING ADDITIVE FOR DECREASING SOIL REDEPOSITION

Albert Robert Eanzel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1975, Ser. No. 542,235

Int. Cl.[2] D06L *1/04*, *1/08*; C11D *7/52*

U.S. Cl. 8—142 4 Claims



EXAMPLE 1

1. A textile cleaning composition comprising textile dry cleaning organic solvent and, by weight of the cleaning composition, about from 0.1% to 2.0% of dry cleaning detergent and about from 0.01% to 0.3% of organic ester of ortho-titanic acid.

4. In a process of agitating textile material in a dry cleaning composition comprising textile dry cleaning organic solvent and about from 0.1% to 2.0%, by weight of the dry cleaning composition, of dry cleaning detergent; separating the textile material from the bath; and drying the textile material; the improvement comprising including in the composition about from 0.01% to 0.3% by weight of the composition of organic ester of ortho-titanic acid.

3,969,074

PROCESS FOR DYEING YARN HANKS

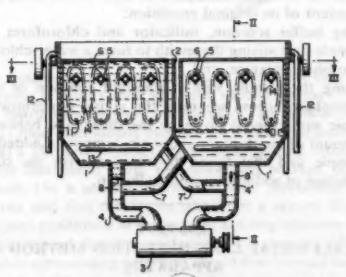
Hui Do Chung, 361 Kaya-dong, Pusanjin, Pusan, South Korea

Filed Mar. 25, 1975, Ser. No. 562,033

Claims priority, application South Korea, May 7, 1974, 2378

Int. Cl.[2] D06B *5/20*

U.S. Cl. 8—155.2 2 Claims



1. A process for dyeing yarn hanks, said process comprising: suspending yarn hanks in each of two separate baths; and repeatedly alternately subjecting said yarn hanks in each of said baths to a dipping dyeing operation and a spraying dyeing operation, said step of subjecting comprising supplying dye into a first of said baths and dip dyeing said yarn hanks therein, while simultaneously spraying dye into a second of said baths and spray dyeing said yarn hanks therein, and then repeatedly alternating said dip dyeing and spray dyeing between said first and second baths.

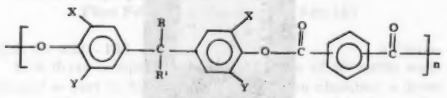
3,969,075

DYEING HALOGENATED AROMATIC POLYESTER FIBROUS MATERIALS WITH ACETOPHENONE

Alex S. Forschirm, Lake Hiawatha, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed July 28, 1975, Ser. No. 599,557
Int. Cl.² D06P 3/54
U.S. Cl. 8—172 R 14 Claims

1. An improved process for the dyeing of a halogenated aromatic polyester fibrous material having recurring units of the formula:



where X is chlorine or bromine, Y is hydrogen, chlorine or bromine, R and R′ may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, and n = at least 25, comprising contacting said fibrous material with an aqueous dyebath at substantially atmospheric pressure and at a temperature of about 80° to 100°C. containing a disperse dye and an effective concentration of an acetophenone dye carrier in the substantial absence of fiber degradation.

3,969,076

METHOD FOR THE ANALYSIS OF IONIC SURFACTANTS

Lawrence K. Wang, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation of Ser. No. 385,775, Aug. 6, 1973, abandoned.
This application May 27, 1975, Ser. No. 580,646
Int. Cl.² G01N 31/00, 31/16, 31/22
U.S. Cl. 23—230 R 5 Claims

1. A method for the analysis of ionic surfactants present in an aqueous solution including the steps of:

obtaining a known volume sample of the aqueous solution to be tested;

adding a standard, cationic, nonaromatic quarternary ammonia solution to the sample in a known amount sufficient to ensure a cationic character to the sample independent of its original condition;

adding buffer solution, indicator and chloroform to the sample and mixing therewith to form a water-chloroform two phase mixture; and

titrating the sample with a standard solution of sodium tetraphenylboron, whereby the actual concentration of ionic surfactant is given by the difference between the amount of quarternary ammonia compound added to the sample and that found by titration with the standard solution of sodium tetraphenylboron.

3,969,077

ALKALI METAL LEAK DETECTION METHOD AND APPARATUS

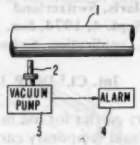
Eugene F. Hill, Belmont, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 208,733, Dec. 16, 1971, abandoned.
This application Mar. 13, 1974, Ser. No. 450,625
Int. Cl.² G01N 31/00, 33/20
U.S. Cl. 23—230 L 25 Claims

1. A method of determining whether or not an alkali metal leak exists in a structure confining the alkali metal comprising the steps of:

exposing the exterior of said structure to a substance including hydrogen in a form chemically replaceable by said alkali metal to form hydrogen gas;

detecting any of said formed hydrogen gas exterior to said structure with a hydrogen gas detection apparatus which provides a signal when said hydrogen is detected; and



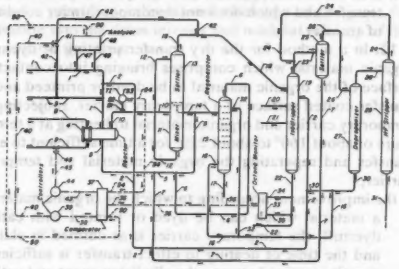
evaluating said signal to determine whether or not said alkali metal leak exists.

3,969,078

HF ALKYLATION REACTION TEMPERATURE CONTROL SYSTEM

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 468,955, May 10, 1974. This application Dec. 19, 1974, Ser. No. 534,399
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.² G05B 21/02; G06G 7/58; C07C 3/54
U.S. Cl. 23—253 A 3 Claims



1. For a process for alkylating an isoparaffin with an olefinic feed stream, to produce a normally liquid alkylate product, wherein (1) said feed stream contains at least two olefinic hydrocarbons and is contacted in admixture with a hydrogen fluoride catalyst, in a reaction zone, and (2) at least a portion of the reaction zone effluent is recycled thereto, the control system, for regulating the temperature within said reaction zone, which comprises, in cooperative combination:

a. conduit means for introducing a cooling medium into said reaction zone, and for removing it therefrom, said cooling medium indirectly contacting the reaction mixture within said zone;

b. first flow-varying means for adjusting the flow of said cooling medium into said reaction zone;

c. second flow-varying means for adjusting the flow of effluent recycled to said reaction zone;

d. a first hydrocarbon analyzer receiving a sample of said olefinic feed stream and developing a first process output signal representative of a composition characteristic thereof;

e. temperature-sensing means for sensing a reaction zone temperature and, in operative association therewith, temperature-indicating means developing a second process output signal representative of said temperature;

f. a second hydrocarbon analyzer receiving a sample of said normally liquid alkylate product and developing a third

process output signal representative of a composition characteristic of said sample;

g. process signal-transmitting means through which said three process output signals are transmitted to computer/comparator means developing a computer output signal in response to, and as a function of said three process output signals; and,

h. computer output signal-transmitting means through which said computer output signal is transmitted to said first and second flow-varying means.

3,969,079

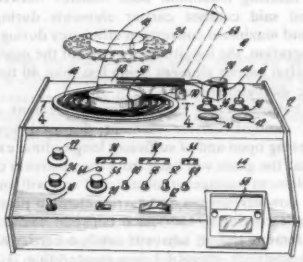
DUAL CHANNEL PHOTO-OPTICAL CLOT DETECTION APPARATUS

Joseph Catarious, Harleysville, Pa.; Lyman Bethke, Trenton, N.J., and Richard Berman, Dresher, Pa., assignors to Alphamedics Mfg. Corporation, Levittown, Pa.

Filed Jan. 8, 1975, Ser. No. 539,520

Int. Cl.² G01N *33/16, 21/24*

U.S. Cl. 23—253 R **8 Claims**



1. A photo-optical clot detection apparatus comprising:

a plurality of plasma sampling stations,

means for indexing said plasma sampling stations into a readout position in between a radiant source and a radiation detector for measuring sample density,

reagent feeding means for automatically feeding reagent to said plasma sampling stations at said readout position and a predetermined number of positions before said readout position,

heating means for heating said plasma sampling station only between said readout position and said predetermined number of positions before said readout position, and

timing means for controlling said indexing means to cause a sample of plasma to remain in said readout position and in the predetermined number of positions immediately prior thereto for only a set period of time.

3,969,080

STABILIZING MEANS FOR LABORATORY WARE

Daniel R. Conlon, 600 Meeting House Road, Jenkintown, Pa. 19046

Filed Aug. 20, 1974, Ser. No. 498,946

Int. Cl.² B01L *3/00, 9/00*

U.S. Cl. 23—259 **12 Claims**

1. A stabilized container having a base area enlarged with respect to a portion of the container above the base area comprising in combination, said container and in cooperative relationship a heavy metal split torus surrounding and resting

on said container at the base area of said container to stabilize said container in its upright resting position.

3,969,081

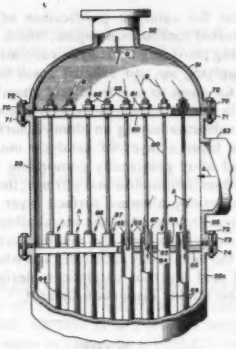
TWO-PHASE CONTACT REACTOR

Ronnie D. Jackson, El Dorado, Ark., assignor to Lion Oil Company, El Dorado, Ark.

Continuation-in-part of Ser. No. 293,629, Oct. 13, 1972, Pat. No. 3,839,548. This application Aug. 16, 1974, Ser. No. 498,232

Int. Cl.² B01J *10/00;* **B01D** *1/06, 3/00*

U.S. Cl. 23—284 **3 Claims**



1. A liquid-gas two-phase interfacial cocurrent flow reactor comprising a unitary shell and tube reactor having

a. a distribution header comprising (1) an annular housing, (2) fluid inlet means therein, (3) a first distributor plate, (4) a plurality of first conduit tubes passing through said first distributor plate for downward passage of a first fluid, (5) a second distributor plate positioned remote from said first distributor plate, (6) a second fluid inlet means positioned in the annular housing between the first and second distributor plates, (7) a plurality of second tubes surrounding a portion of said first conduit tubes and passing through said second distributor plate for downward passage of a second fluid, said first conduit tubes terminating within said second tubes and beyond said second distributor plate, wherein said first tubes are fixed to the interior walls of said second tubes and said first tubes are provided with fluid outlet means for directing flow of said first fluid tangent to said interior walls of said second tubes

b. a reactor section comprising (1) an annular housing, (2) a plurality of said second tubes passing through said second distributor plate and through a holder plate at the end of the reactor section remote from said second distributor plate, (3) fluid inlet and outlet means in said

annular housing providing for passage of a third fluid about said plurality of second tubes, and

c. a collection header at the end of the reactor remote from the distributing header comprising (1) an annular housing, (2) said holder plate of said reactor section, (3) a plurality of said second tubes passing through and terminating beyond said holder plate and (4) a fluid outlet means in said annular housing for removal of fluids from said reactor.

3,969,082

APPARATUS FOR PURIFYING EXHAUST WASTE GASES

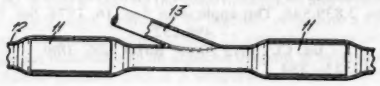
James Anthony Cairns, Wantage; Richard Stuart Nelson, Goring on Thames, and Stanley Frederick Pugh, Abingdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed July 2, 1973, Ser. No. 375,773

Claims priority, application United Kingdom, Mar. 30, 1973, 15579/73

Int. Cl.² F01N *3/15, 7/04*

U.S. Cl. 23—288 FC **11 Claims**



1. Apparatus for catalytic purification of waste exhaust gases of an internal combustion engine, which apparatus comprises: a housing providing a catalytic reaction chamber; inlet means for supplying air and exhaust gases to said chamber; outlet means for gases to exit from said chamber; and a catalytic element in said chamber, said catalytic element including a metal alloy substrate having an alumina surface layer, upon which surface layer a layer of catalytic material has been deposited, said alloy principally comprising iron with additions of chromium, aluminium and yttrium, the alloy substrate having the essentially alumina surface layer formed on the substrate by heat treatment of the metal alloy substrate in an oxidizing atmosphere to form the alumina surface layer from aluminium in the metal alloy substrate, and wherein, the major proportion of said layer of catalytic material comprises an unagglomerated atomic dispersion thereof.

3,969,083

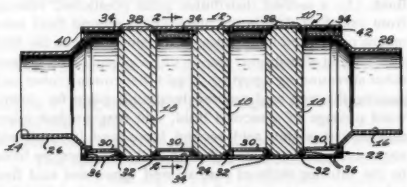
CATALYTIC CONVERTER FOR PURIFYING GASES

William R. Givens, Hoffman Estates, and Charles D. Lemme, Oak Park, both of Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Nov. 26, 1973, Ser. No. 419,132

Int. Cl.² B01J *8/02, 35/04;* F01N *3/15*

U.S. Cl. 23—288 FB **7 Claims**



1. A catalytic converter comprising:

an annular casing structure having an inlet for receiving a flow of exhaust gases emitted from an automotive engine or the like and an outlet for discharging the gases received in said inlet after flowing through said casing structure;

a plurality of separate catalyst carrier elements of porous, inert, solid, refractory material in skeletal form providing a multiplicity of generally parallel closely adjacent flow passages each extending throughout the longitudinal extent thereof;

catalyst means deposited on surfaces of macropores communicating with said passages and surfaces defining said passages of each catalyst carrier element;

means for mounting said catalyst carrier elements in spaced relation within said casing structure for the flow of gases through substantially the entire extent of said catalyst carrier elements in series;

the total surface area provided by said plurality of catalyst carrier elements on which said catalyst means is deposited being of an extent sufficient that when contacted by the exhaust gases normally emitted by known automotive engines a required pollutant conversion is effected;

the longitudinal extent of the passages of each catalyst carrier element being so interrelated with the size and number of passages provided within the aforesaid substantially entire extent thereof as to insure that the flowing exhaust gases, which enter the passages in a turbulent condition without appreciable back pressure when the automotive engine is at fast idle, will contact the associated catalyst means throughout substantially the entire longitudinal extent of the associated passages before being changed to a fully developed laminar condition thereby insuring maximum heat transfer between the gases and said catalyst carrier elements during cold startup and maximum conversion efficiency during subsequent operation, the longitudinal extent of the passages of each catalyst carrier element being less than 40 times the hydraulic diameter thereof;

the space between each catalyst carrier element and an adjacent catalyst carrier element disposed upstream thereof being open and of sufficient longitudinal extent to insure that the gases will issue from the upstream catalyst carrier element passages unobstructed and will enter the adjacent downstream catalyst carrier element passages in a turbulent condition, the space between each catalyst carrier element and an adjacent catalyst carrier element disposed upstream thereof being greater than 10 times the hydraulic diameter of the passages thereof.

3,969,084

COPPER-BASE BEARING MATERIAL CONTAINING CORROSION-RESISTANT LEAD ALLOY

Sakae Watanabe, Tokyo, and Heihachiro Ohigawa, Funabashi, both of Japan, assignors to Nissan Motor Co., Ltd. and Nippon Dia Clevite Company, Limited, both of, Japan

Filed May 21, 1974, Ser. No. 472,057

Claims priority, application Japan, June 1, 1973, 48-61607

Int. Cl.² B22F *3/00*

U.S. Cl. 29—182.1 **3 Claims**

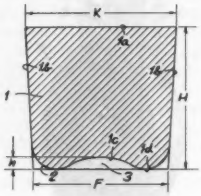
1. A bearing material consisting essentially of 45 to 90% of a sintered mass of copper powder impregnated with 10 to 55% of an alloy consisting of essentially 1 to 3% Sn, 0.5 to 3.5% Bi and the balance of Pb.

3,969,085

WIRE AND METHOD FOR MAKING STEEL WOOL

Hermann Josef Boeckenhoff, Blecher; Günter Thoms, and Erich Pueschner, both of Cologne, all of Germany, assignors to Arbed-Felten & Guilleaume Drahtwerke GmbH, Cologne-Mulheim, Germany

Filed June 9, 1975, Ser. No. 584,819
Claims priority, application Germany, June 8, 1974, 2427780
Int. Cl.² E04C 5/00; B21C 37/00
U.S. Cl. 29—193 9 Claims



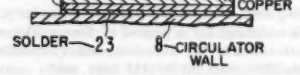
1. A wire for making steel wool, said wire being solid and having a cross-sectional profile with a straight top, a pair of sides extending down from said top, and a downwardly and outwardly concave bottom, said wire being narrower at said bottom than at said top.

3,969,086

METALLIZED GYROMAGNETIC FERRITE

Victor A. Vaguine, Palo Alto, and Dennis R. Nichols, San Jose, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 337,059, March 1, 1973, Pat. No. 3,873,944. This application Oct. 8, 1974, Ser. No. 513,021
Int. Cl.² B32B 15/04
U.S. Cl. 29—195 5 Claims



1. In combination, a body of gyromagnetic ferrite material for causing nonreciprocal trnsmission of microwave power, and a metallic coating, said metallic coating covering a portion of said gyromagnetic ferrite body whereby said body can be affixed by soldering to a metal object, said metallic coating comprising at least three metal layers, a first one of said layers adhering to said gyromagnetic ferrite material and comprising a metal selected from the group consisting of nichrome, molybdenum and chromium, a second one of said layers adhering to said first layer and comprising copper, and a third one of said layers adhering to said second layer and comprising gold.

3,969,087

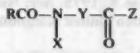
GELS OF NONPOLAR LIQUIDS WITH N-ACYL AMINO ACIDS AND DERIVATIVES THEREOF AS GELLING AGENTS

Tadaomi Saito; Yoshimasa Matsuzawa; Sadayoshi Ninagawa, all of Yokohama; Masao Honna, Kawasaki; Masahiko Takesada, Tokyo, and Masahiro Takehara, Fujisawa, all of Japan, assignors to Ajinomoto Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,488
Claims priority, application Japan, Aug. 7, 1974, 49-90633; Aug. 7, 1974, 49-90634
Int. Cl.² C10L 7/02
U.S. Cl. 44—7 C 30 Claims

25. A gel, consisting essentially of:

a homogeneous mixture of a non-polar organic liquid having a dielectric constant of less than 20 and having a solubility less than 10% by weight in water and 0.05% to 20% by weight of at least one compound containing an N-acylamino acid component having the formula

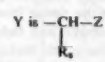


wherein RCO is a C_2 to C_{30} aliphatic acyl group or an aralkyl acyl group; Z is hydroxy, $-NH_2$, $-OR_1$, $-NHR_2$,

or $-O^-R_5NH_3^+$, wherein R_1, R_2, R_3, R_4 and R_5 is a C_2 to C_{30} aliphatic hydrocarbon group and aralkyl groups; X is hydrogen or methyl; and

wherein R_6 is C_1 to C_4 alkyl, benzyl, phenyl, $-CH_2OH$,

$-CH_2SH$, $-CH_2CH_2-S-CH_3$ or $-(CH_2)_pCOZ$; and p is a positive integer of 1 or 2, and Z is the same as above; $-(CH_2)_mNHCOR$, wherein m is a positive integer of 3 or 4 and COR is the same as above, or $-(CH_2)_n-$, wherein n is a positive integer of 1 to 6, with the proviso that when Z is $-OR_1$,



wherein R_6 is $-(CH_2)_mNHCOR$ and that at least one of R, R_1, R_2, R_3, R_4 and R_5 is a C_5 to C_{30} aliphatic hydrocarbon group.

3,969,088

FORMCOKE PROCESS

Vaughn Mansfield, Gallatin, and Charles M. Whitten, Columbia, both of Tenn., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 572,317
Int. Cl.² C10L 5/00
U.S. Cl. 44—10 C 12 Claims

1. A process for producing formcoke comprising,

charring sized green coal and reducing the volatile content thereof by continuously feeding the same through pretreatment carbonizer having an oxidizing atmosphere and rapidly increasing the temperature thereof by combustion of primarily volatile matter in the green coal and limited quantities of air,

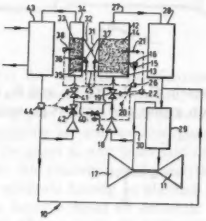
further reducing the volatile content of the char by feeding the same through a post-treatment carbonizer having a reducing atmosphere,
passing the char from the carbonizer through a cooler,
crushing the cooled char,
mixing the crushed char with pitch,
forming the mixture of crushed char and pitch into green briquettes,
curing and cooling the green briquettes by recycling the same with the sized green coal through at least one of the carbonizers and the cooler,
and separating the cooled briquettes from the char.

3,969,089

MANUFACTURE OF COMBUSTIBLE GASES

Gerald Moss, Oxford, and John William Thomas Craig, Wantage, both of England, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 305,319, Nov. 10, 1972, abandoned.
This application June 9, 1975, Ser. No. 584,963
Claims priority, application United Kingdom, Nov. 12, 1971, 52656/71
Int. Cl.² C10J 3/54; C01B 2/14
U.S. Cl. 48—197 R 8 Claims



1. A method for producing a substantially sulphur-free combustible fuel gas from a sulphur-containing fuel comprising: feeding a sulphur-containing fuel into a bed of particles comprising an alkaline earth metal oxide and contained within a reactor, said bed of particles being fluidized by an upwardly flowing stream of an oxygen-containing gas at a superatmospheric pressure, the rate of supply of said oxygen-containing gas and the partial pressure or concentration of oxygen therein being so adjusted in relation to the fuel feed rate that the oxygen supplied is insufficient for complete combustion of the fuel, whereby the sulphur-containing fuel is partially combusted at a temperature in the range from about 800° to about 1000°C. which is varied above and below the recarbonation temperature of said alkaline earth metal oxide at the superatmospheric pressure employed such that the average temperature in the reactor bed is below the recarbonation temperature of the alkaline earth metal oxide whereby a portion of the alkaline earth metal oxide is converted to the corresponding carbonate and a substantially sulphur-free combustible gas is formed as the result of the sulphur from the sulphur-containing fuel becoming fixed in the particles of the bed as an alkaline earth metal sulphide by reaction with the corresponding alkaline earth metal oxide in the particles; recovering a substantially sulphur-free combustible gas from the reactor bed; transferring particles comprising an alkaline earth metal carbonate and an alkaline earth metal sulphide from a first region of the reaction bed of particles to a first region of a regenerator wherein said particles are contained and contacted with an upwardly flowing stream of an oxygen-containing gas at a temperature within the range from 1035°C. to 1300°C., whereby said alkaline earth metal sulphide and said alkaline earth metal carbonate are converted to the corresponding alkaline earth metal oxide with the liberation of sulphur dioxide and carbon dioxide, the temperature in said regenerator being at least partially controlled by controlling the amount of alkaline earth metal carbonate actually formed in said reactor.

3,969,090

INDUSTRIAL BRUSH

Robert C. Sasena, Irwin, Pa., and Roger E. Priest, Holden, Mass., assignors to Anderson Corporation, Worcester, Mass.

Filed June 22, 1973, Ser. No. 372,597
Int. Cl.² B24D 11/00; A46B 13/00; A46D 1/00
U.S. Cl. 51—400 6 Claims

1. An industrial brush, comprising:
a. a base having a central bore through which a spindle can pass for rotation of the base, and
b. a plurality of generally cylindrical filaments with their axes extending radially from the base, each filament consisting of a tube braided from strands of a synthetic resin, a core extending through the center of the braided tube, the core being formed of nylon in which is embedded fine particles of abrasive.

3,969,091

PROCESS FOR DESICCANT DRIER REGENERATION

Bruce R. Tegge, Madison, N.J., and Barry M. Rosenbaum, New York, N.Y., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 13, 1972, Ser. No. 271,344
Int. Cl.² B01D 53/02; C07C 11/02, 11/06; B01J 21/20
U.S. Cl. 55—33 11 Claims

1. A method for regenerating a desiccant drier deactivated by the dehydration of a higher alpha olefin, said alpha olefin being used in a process comprising copolymerization of ethylene and said higher alpha olefin and employing Ziegler-type catalysis which comprises the steps of:
a. contacting said drier with a portion of dry recycle polymerization diluent for a period of time sufficient to remove substantially all adsorbed water therefrom and reactivate the desiccant in said drier, and
b. passing the diluent used in regeneration from said drier to a polymerization diluent purification system employed for recycle of diluent in the copolymerization process.

2. The method of claim 1 wherein the dry polymerization diluent used in regeneration of said drier is heated to a vaporous state prior to contact with said drier and which method additionally comprises the subsequent step of contacting said drier after reactivation of said desiccant with a portion of dry liquid recycle polymerization diluent for a period of time sufficient to cool said desiccant to a temperature suitable for dehydration of said alpha olefin.

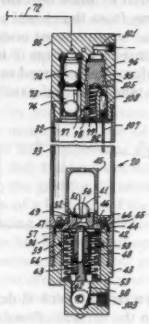
3. The method of claim 2 wherein said diluent is hexane.

5. The method of claim 1 wherein said copolymerization process is a terpolymerization process and the termonomer is a nonconjugated diene.

3,969,092
LIQUID DEGASSING DEVICE

John A. Huffman, Northridge, and Vincent G. Magorien, Granada Hills, both of Calif., assignors to Seaton-Wilson, Incorporated, Burbank, Calif.

Filed Jan. 10, 1974, Ser. No. 432,184
Int. Cl.² B01D 19/00
U.S. Cl. 55—160 18 Claims



1. In a device for removing dissolved and entrained gas from a liquid, a combination comprising:

chamber means having inlet means for receiving oil to be degassed and outlet means for discharging degassed oil;

means for producing a relatively low pressure in said chamber means;

automatic cycling valve means comprising

level-actuated means for closing said outlet means at a first location when liquid in said chamber means falls to a certain level, and

pressure-actuated means independent of said level-actuated means, for closing said outlet means at a second location, opening said outlet means at said first location, and rapidly opening said outlet means at said second location when a preselected increased pressure is reached after closing of said outlet means by said level-actuated means; and

gas venting means in said chamber means, for releasing separated gas as the liquid level rises after closing of said outlet means;

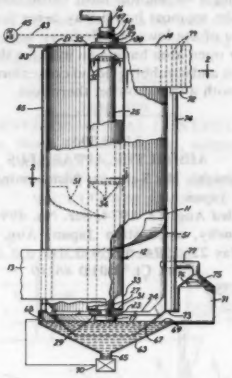
whereby said automatic cycling valve means operates automatically to alternatively close and open said outlet means continuously even in industrial and airborne environments.

3,969,093
CYCLONIC GAS SCRUBBING SYSTEM

Daniel N. Murray, Jr., Erie, Pa., assignor to Hammermill Paper Company, Erie, Pa.

Continuation of Ser. No. 321,777, Jan. 8, 1973, abandoned.
This application Nov. 5, 1974, Ser. No. 521,147
Int. Cl.² B01D 47/00
U.S. Cl. 55—229 7 Claims

5. A cyclonic gas cleaning system comprising, an elongated housing, an elongated spray header mounted centrally of said housing along the axis thereof, a gas inlet duct and a gas outlet duct at opposite ends of said housing and being tangential to the interior thereof to impart a generally helical flow to gas passing from said inlet duct to said outlet duct in the space between said spray header and said housing, means for conducting a scrubbing fluid to said spray header, means for supproting said spray header for rotation relative to said housing, means associated with said spray header for varying the speed and direction of rotation of said spray header, a plurality of elongated collection headers extending axially along the outside of said housing and having slots opening into said housing, said housing having an open region at its lower end, means associated with said housing and said collection headers and defining a closed reservoir for receiving solid and gas particles entering said collection headers, means between the lower ends of said collection headers and siad open region of

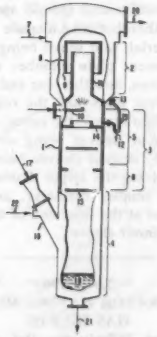


said housing for isolating said gases received within said reservoir from said collection headers from direct communication with said open region of said housing, and means associated with said reservoir for effecting reentry of gases received within said reservoir from said collection headers into the interior of said housing for passing said gases into the flow of gas within said housing from said inlet duct to said outlet duct.

3,969,094
FLUE GAS SCRUBBER

James B. Dunson, Jr., and Robert L. Lucas, both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 11, 1973, Ser. No. 423,728
Int. Cl.² B01D 47/06
U.S. Cl. 55—242 6 Claims



1. A scrubber for removing contaminants from a gas stream by contacting the gas with a scrubbing liquid to form a froth in which the scrubbing liquid constitutes the continuous phase comprising a vertical column having in fluid communication an upper liquid de-entrainment area, an intermediate scrubbing area and lower open area

a. the de-entrainment area having means for de-entrainment of liquids from the gas stream, an outlet for the gas from which entrained liquids have been removed an inlet for

feeding a liquid scrubbing stream into the deentrainment area and means for removing de-entrained liquids from the de-entrainment area;

b. the scrubbing area having a plurality of baffle trays, means between the liquid scrubbing stream inlet and the topmost baffle tray for receiving deentrained liquid and discharging it on the top most baffle tray, the free open area of the topmost baffle tray being less than the free open area of the lower baffle trays; and

c. the lower open area having an inlet for the contaminated gas stream and scrubbing liquid collection means communicating with a liquid outlet therefrom.

3,969,095

AIR FILTER APPARATUS

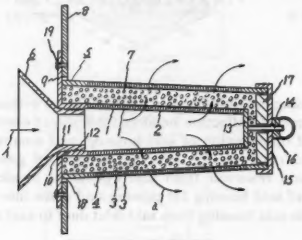
Shigeru Kurahashi, 28, 5-chome, Nishisuminoe-cho, Sumiyoshi, Osaka, Japan

Filed Aug. 23, 1974, Ser. No. 499,917

Claims priority, application Japan, Aug. 25, 1973, 48-99772[U]; May 22, 1974, 49-59123[U]

Int. Cl.² B01D *46/30*

U.S. Cl. 55—350 **5 Claims**



1. An apparatus for use in the filtration of air which comprises a frusto-conically shaped inner sleeve defining a central zone and containing a plurality of small apertures and a frusto-conically shaped outer sleeve containing a plurality of small apertures, the number of said small apertures per unit area being gradually increased from the rear end toward the front end of said inner and outer sleeves, said inner sleeve being coaxially disposed within and spaced apart from said outer sleeve and defining therebetween a space which is adapted to contain a filter material, said space being closed at the front end with an attachment plate member which connects the inner and outer sleeves, and the rear end of the inner sleeve being closed by a rear plate and the rear end of the outer sleeve being closed by a removable cover, said inner and outer frusto-conically shaped sleeves being cover, said inner and outer frusto-conically shaped sleeves being tapered from the front end thereof having the larger diameter to the rear end thereof having the smaller diameter, and a funnel-shaped suction port disposed at the inlet end of the central zone and associated with the inner sleeve.

3,969,096

CYCLONE SEPARATOR HAVING MULTIPLE-VANED GAS INLETS

Paul Herbert Richard, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 16, 1974, Ser. No. 515,242

Int. Cl.² B01D *45/12*; B04C *5/04*

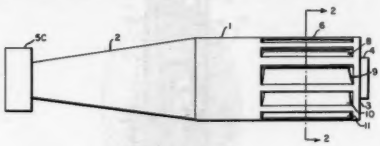
U.S. Cl. 55—455 **1 Claim**

1. A cyclone separator for separating suspended solid particles from a gas, comprising

i. a cylindrical first shell having an open first end and a second end closed except for an opening designed to accommodate a gas outlet tube; said shell haing a gas inlet in its periphery near its second end, said shell having a gas outlet tube sealably mounted in the opening in the second end of the shell, said outlet tube being coaxial with the shell, extending into the shell past the gas inlet, and separated from the gas inlet; and

ii. a second shell of circular periphery having two open ends, the first open end sealably engaging, communicating with, and coextensive with the open first end of the cylindrical first shell, and the second open end being a solids discharge opening located beyond the end of the gas outlet tube that extends into the cylindrical shell, in the direction away from the closed end of the cylindrical shell; wherein the improvement comprises

iii. the gas inlet consisting of from 3 to 30 elongated inlet openings circumferentially spaced in the periphery of the cylindrical shell, and disposed axially therein, said inlet



openings having a depth which is defined as the shortest distance between the surface of one vane and the surface of another vane, which surfaces restrict gas flow into the separator, each opening having a guide vane positioned to deflect incoming gas away from the gas outlet tube, in a circular path,

wherein all guide vanes are of the same length and axial orientation,

wherein each guide vane begins at the shell periphery and extends inside the cylindrical shell periphery, and

wherein the ratio of inlet opening depth to the radial distance between the outlet tube and the cylindrical shell is in the range 0.1 to 0.7, and the product of this ratio times the number of inlet openings is in the range 1 to 4.5.

3,969,097

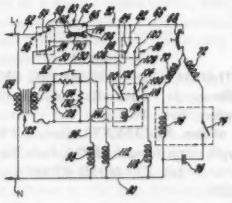
SLAB COMPLETION THERMOSTAT WITH TIME DELAY FUNCTION

Ralph S. Braden, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1975, Ser. No. 589,471

Int. Cl.² F25C *1/12*

U.S. Cl. 62—137 **2 Claims**



1. In a slab type ice maker having an electrically driven compressor refrigerant system for flow of cold refrigerant through the inlet tube of an evaporator to cool an evaporator plate with water circulation produced thereover by electrically energized pump means for build up of an ice slab on the plate and including an electrically energized grid located below the plate for receiving an ice slab therefrom for subsequent separation into individual cubes to be received in an ice storage bin located below the grid, the improvement comprising: first circuit means for energizing the compressor and

pump means including a slab thickness switch having first and second positions and bin level switch means responsive to ice accumulation within the bin, thermal delay relay means being operative to bypass the bin level switch means immediately upon maximum buildup of a predetermined ice level in the bin, an evaporator inlet tube, said thermal delay relay means including a bimetallic element and a temperature sensing portion located on said evaporator inlet tube for sensing the temperature of refrigerant therein, said bimetallic element being located in shunt relationship to the bin level switch means and in series connection with said slab thickness switch to maintain the compressor and pump means operative following maximum ice build up when said slab thickness switch is in its first position, defrost means energized when a predetermined ice thickness is sensed by said slab thickness switch to cause it to assume its second position, said defrost means including means to maintain a flow of hot gas through the evaporator inlet tube and evaporator to the slab to release it upon opening of the slab thickness switch, thereby to direct a fresh slab of ice onto the grid for division into the cubes representing a termination of a build up of ice therein and to assure the feed of an ice having the desired clarity into the bin at the end of each of the ice bin fill cycles of operation, said bimetallic disc being responsive to flow of hot gas through the evaporator inlet tube to concurrently terminate a defrost cycle and machine operation following a predetermined time delay when the bin is filled with ice.

3,969,098

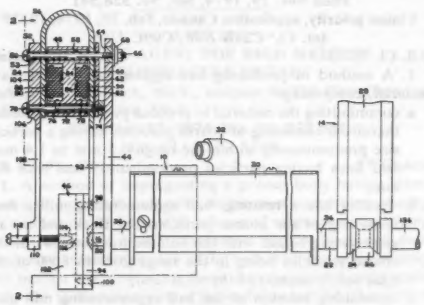
CONTROL APPARATUS AND SYSTEM FOR CLOSELY SPACED HEATING ELEMENTS

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 531,942, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 320,381, Jan. 2, 1973, abandoned. This application Mar. 31, 1975, Ser. No. 563,930

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **8 Claims**



1. A heating control system for supplying individually controlled heating currents to a plurality of orifice tubes utiliized to form glass fibers comprising a manifold in communication with a molten glass supply means and said orifice tubes for delivering molten glass thereto, a common power source for said plurality of orifice tubes, said power source including a bus bar connected to and energized by the secondary winding of a power supply transformer, an individual clamping arm for each of said orifice tubes, each arm being pivotally secured at one end to, but electrically insulated from, said bus bar and having means at its other end for mechanically positioning its corresponding orifice tube in engagement with its electrical supply, an individual electrically conductive contact arm connected between said bus bar and each of said orifice tubes for supplying current from said power source to each orifice tube, each said contact arm being secured at one end to said bus bar and insulated therefrom, a spring arm spaced from and generally parallel to each said contact arm, each said spring arm being secured at one end and electrically insulated from said bus bar and including at its other end releasable means for urging its corresponding contact arm toward said orifice tube, individual, controllable semiconductive current regulating means interposed between said bus bar and each said contact arm and individual circuit means controlling each of said current regulating means.

3,969,099

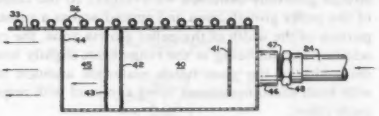
BUSHING ENVIRONMENTAL CONTROL SYSTEM

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 7, 1974, Ser. No. 512,647

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **9 Claims**



1. In the manufacture of glass fibers comprising attenuating glass fibers from molten glass through bushing tips; the improvement comprising passing directly at about right angles to the bushing tips and at a level with or slightly below said tips, a gaseous fluid as a stream, said gaseous fluid being passed thereto from a pressurized means for supplying said gaseous fluid; passing said gaseous fluid through a chamber having a baffle plate followed by a plurality of screens to divert and irregularly deflect said gaseous fluid before release to said bushing tips to provide an even flow of gaseous fluid across the length of the bushing.

3,969,100

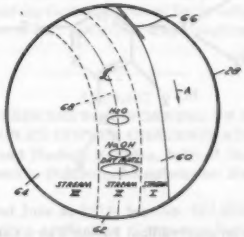
METHOD OF PELLETIZING GLASS BATCH MATERIALS

Kenneth J. Kuna, Plymouth, and James P. Sowman, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 27, 1975, Ser. No. 553,859

Int. Cl.² C09C *1/56*

U.S. Cl. 65—27 **5 Claims**



1. A method of pelletizing glass batch materials including commercially available sand, soda ash (sodium carbonate), salt cake (sodium sulfate), other minor glass forming materials, dolomite having an average (statistical mean) particle size less than 15 microns, and limestone having an average (statistical mean) particle size less than 250 microns which comprises the steps of:

mixing the glass batch materials together;

establishing on a rotating pelletizing disc a pelletizing regime in which three zones of pelletization exist in the

form of a pellet nucleation zone, a pellet growth zone, and a pellet tumbling zone; each of the zones existing generally from the top of the pelletizing disc downwardly over an area of the pelletizing disc with each zone having a decernable width;

adding a prescribed amount of water to a portion of the pellet growth zone;

adding a prescribed amount of a caustic soda solution to a portion of the pellet growth zone spaced downwardly from the top of the zone, the caustic addition being in the form of a wide stream generally centered with respect to the centerline of the pellet growth zone and spread across a substantial portion of the width of the pellet growth zone; and

adding a prescribed amount of the mixed glass batch materials to a portion of the pellet growth zone spaced downwardly from the caustic addition position, the mixed batch materials addition being in the form of a wide stream generally centered with respect to the centerline of the pellet growth zone and spread across a substantial portion of the width of the pellet growth zone, the caustic addition stream being in the range from slightly less than the width of the glass batch materials addition stream with both addition streams being centered with respect to each other.

3,969,101

AGENT FOR CONTROLLING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

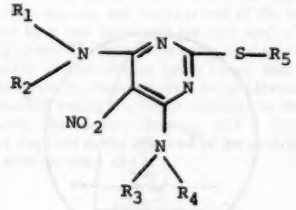
Division of Ser. No. 252,385, May 11, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,438

Claims priority, application Switzerland, May 17, 1971, 7229/71

Int. Cl.² A01N 9/22

U.S. Cl. 71—92 14 Claims

1. A composition for the control of undesired plant growth in cultivated crops which comprises (a) as active substance, an effective growth controlling amount of a 5-nitropyrimidine of the formula



wherein

R_1 represents an alkyl radical having 2 to 6 carbon atoms; an alkenyl radical or alkinyl radical having 3 to 5 carbon atoms; an alkoxyalkyl, alkylaminoalkyl, or trialkylammonioalkyl radical having 1 to 6 carbon atoms in the alkyl groups thereof; a hydroxyalkyl or cyanoalkyl radical having 1 to 4 carbon atoms; or a cycloalkyl radical having 3 to 6 carbon atoms;

R_2 and R_3 each independently represent hydrogen, or a lower alkyl radical;

R_4 represents hydrogen, a lower alkyl radical, a cycloalkyl radical having 3 to 6 carbon atoms;

R_5 represents a lower alkyl radical;

together with (b) an inert carrier therefor.

3,969,102

HERBICIDES

Takeo Yoshimoto; Keiichi Igarashi, both of Yokohama; Takeo Harayama, Kamakura; Masaaki Ura, Kamakura; Naoki Sato, Kamakura; Teruhiko Toyama, Fujisawa; Osamu Morikawa; Yoshio Takasawa, both of Chigasaki, and Taisuke Kurechi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,284

Claims priority, application Japan, Aug. 28, 1973, 48-95712

Int. Cl.² A01N 9/24; C07C 43/20

U.S. Cl. 71—124 5 Claims

1. 2,4-Dichloro-3′-(β-chloroethoxy)-4′-nitrodiphenyl ether.

2. A herbicide comprising 2,4-dichloro-3′-(β-chloroethoxy)-4′-nitrodiphenyl ether in a herbicidally effective amount and an inert carrier or vehicle.

3,969,103

METHOD OF PRODUCING BALL AGGLOMERATED PARTICULATE MATERIAL

Charles E. Capes; Allan E. McIlhinney, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 29, 1974, Ser. No. 528,541

Claims priority, application Canada, Feb. 25, 1974, 193397

Int. Cl.² C22B 1/08; C09C 1/56

U.S. Cl. 75—3 5 Claims

1. A method of producing ball agglomerated particulate material, comprising:

a. comminuting the material to produce particulate material therefrom consisting of coarse particles having a particle size predominantly within the range 0.3 mm to 1.4 mm, and fines having particles predominantly less than 0.2 mm,

b. feeding into a rotating, ball agglomerating mill a feed consisting of the coarse particles, the fines and an agglomerating liquid, with the volume fraction (m) of the coarse particles being in the range 20% to 80% of the total solids content of the total feed,

c. continuing rotation of the ball agglomerating mill until agglomerated balls of the particulate material are produced having a continuous network of the fines interspersed with the coarse particles such that:

$$\left(\frac{1-\epsilon}{\epsilon}\right) \Big/ \left(\frac{1-\epsilon_o}{\epsilon_o}\right) = K \left(\frac{1}{1-m}\right)$$

where

ϵ = the porosity of the agglomerates,

ϵ_o = the porosity of similar agglomerates formed entirely of the fines, m is the above mentioned volume fraction of coarse particles, and

k = 0.7 to 1.0 and then

d. removing the agglomerated balls from the ball agglomerating mill.

3,969,104
GRANULES OF MAGNESIUM AND ITS ALLOYS

Ivan Andreevich Barannik, ulitsa Lenina, 182a, kv. 22, Zaporozhie; Gennady Ivanovich Belkin, ulitsa Kalinaya, 7, kv. 13, Solikamsk; Viktor Ivanovich Borodin, ulitsa Fersmana, 18, kv. 13, Apatity Murmanskoi oblasti; Natalya Alexandrovna Voronova, pereulok Uritskogo, 11, kv. 4, Dnepropetrovsk; Oleg Nikolaevich Romanenko, ulitsa Sevastopolskaya, 6, kv. 46, Kalush Ivano-Frankovskoi oblasti; Alexandr Petrovich Bogdanov, bulvar Tsentralny, 3, kv. 44, Zaporozhie; Valery Sergeevich Belosludtsev, ulitsa Kalinaya, 144, kv. 13; Vladimir Dmitrievich Marfin, ulitsa Kalinaya, 153, kv. 33, both of Solikamsk; Nikolai Yakovlevich Shish, ulitsa Gryaznova, 88, kv. 3, Zaporozhie; Anatoly Filippovich Shevchenko, ulitsa G. Pushkina, 1b, kv. 52; Ivan Yakovlevich Emelyanov, ulitsa G. Pushkina, 1b, kv. 58, both of Dnepropetrovsk; Jury Nikolaevich Boiko, prospekt Lenina, 155, kv. 10, Zaporozhie; Mikhail Nikolaevich Kljuchnik, ulitsa Kalinovaya, 94, kv. 46, Dnepropetrovsk; Nikolai Vasilievich Khaber, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi olbasti; Viktor Georgievich Raskatov, ulitsa Khimikov, 14, kv. 18, Kalush Ivano-Frankovskoi oblasti; Alexandr Fedorovich Trukhin, ulitsa Zhdanova, 11, kv. 32, Kalush Ivano-Frankovskoi oblasti; Anatoly Borisovich Kondratenko, ulitsa Sevastopolskaya, 4, kv. 6, Kalush Ivano-Frankovskoi oblasti; Vladimir Dmitrievich Yazev, ulitsa Bogdana Khmelnitskogo, 66, kv. 59, Kalush Ivano-Frankovskoi oblasti; Viktor Stepanovich Alontsev, ulitsa Kalinaya, 124, kv. 15; Valery Alexeevich Startsev, ulitsa Kalinaya 124, kv. 4, both of Solikamsk, and Jury Alexandrovich Sergeev, prospekt Lenina, 182a, kv. 23, Zaporozhie, all of U.S.S.R.

Division of Ser. No. 443,845, Feb. 19, 1974, Pat. No. 3,881,913. This application Feb. 18, 1975, Ser. No. 550,767

Int. Cl.[2] B22D *23/08*

U.S. Cl. 75—.5 B **7 Claims**

1. A magnesium-salt powder consisting essentially in weight percent of 65 to 97 granulated magnesium, 0.3 to 16 magnesium and alkali metal chlorides, 0.1 to 10 of a fluoride selected from the group consisting of alkali and alkaline-earth metal fluorides, up to 3 alkaline-earth metal chlorides, and up to 6 magnesium oxide.

3,969,105
TREATING AGENT FOR HIGH MELTING TEMPERATURE METALS

Jack J. Ott, Hemlock, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1974, Ser. No. 537,048

Int. Cl.[2] C22C *33/08*

U.S. Cl. 75—53 **17 Claims**

1. A method of impregnating a porous body having interconnecting pores therein with magnesium comprising coating the surface of the body with a layer of magnesium, oxidizing at least a portion of the magnesium surface layer and then immersing at least a portion of the body with the oxide coating into molten magnesium to form a magnesium impregnated body with at least a portion of the surface coated with oxidized magnesium.

3,969,106
SELECTIVE HYDROMETALLURGICAL SEPARATION OF LEAD FROM COMPLEX LEAD-ZINC-COPPER SULFIDE ORES OR DERIVED CONCENTRATES

William John Wark, Bridgewater, Canada, assignor to Zeo-Mag Research Limited, Nova Scotia, Canada

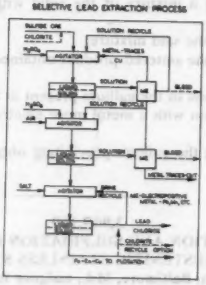
Filed June 3, 1975, Ser. No. 583,326

Int. Cl.[2] C22B *13/04*

U.S. Cl. 75—101 R **28 Claims**

1. A hydrometallurgical process for the selective separation of lead values from complex sulfide ores containing lead sulfide (galena) or derived concentrates thereof, which comprises the following steps, in sequence:

1. reacting said sulfide ore or concentrate in finely divided form with a dilute non-oxidizing mineral acid under reducing conditions, and adjusting the system to a pH of 0.5, thereby to extract substantially all readily soluble iron in the system from said ore or concentrate, said mineral acid being added to the system while the ore suspension is being mildly agitated, at a rate such that hydrogen sulfide evolution is substantially inhibited;
2. effecting a liquid-solids separation while maintaining said system under reducing conditions, to remove said readily soluble iron from the system;
3. repulping the solids in dilute sulfuric acid to form an aqueous suspension of said solids, and adjusting the pH of the suspension to a value of 0.5, while contacting said suspension with an oxygen-containing gas under strong conditions of agitation;
4. adding to said suspension a water-soluble copper salt in an amount sufficient to yield a free excess of approxi-



mately 0.001 gm/liter of cupric ion (Cu^{++}) in terms of the aqueous ore suspension system, and intimately contacting under strong conditions of agitation said aqueous suspension of ore for a period of 8–10 hours with an oxygen-containing gas in the presence of a naturally occurring insoluble material having a cation exchange capacity of the order of 40 milliequivalents/100 gm. and an anion exchange capacity of the order of 20 milliequivalents/100 gm. whereby there is provided a controlled amount of Fe^{++} in the system and said amount of Fe^{++} in the system and said amount of Fe^{++} is maintained throughout said oxidation step, said lead sulfide being substantially quantitatively converted to lead sulfate;

5. effecting a second liquid-solids separation; and
6. removing the lead values of said ores, present in the solid residue resulting from said second liquid-solids separation in the form of lead sulfate, or lead complexes, from said residue.

3,969,107
COMBINED PROCESS FOR WORKING UP PURE AND COMPLEX COPPER CONCENTRATES

Karl Lippert, and Herbert Kudelka, both of Duisburg, Germany, assignors to Duisburger Kupferhutte, Duisburg, Germany

Filed June 4, 1975, Ser. No. 583,828

Claims priority, application Germany, June 14, 1974, 2428793

Int. Cl.[2] C22B *13/04, 11/04, 15/08*

U.S. Cl. 75—101 R **8 Claims**

1. A process for working up of a concentrate containing Cu, Zn, and precious metal including at least one of Ag or Au, which comprises:

a. in a first stage, leaching the concentrate, the concentrate activated by a pre-treatment, or the concentrate after sulfatizing roasting thereof, for hydrometallurgically dissolving out the copper and zinc and leaving a residue

containing the precious metal, and separating the leach liquor from the residue, and

b. in a second stage, subjecting the residue to a chlorinating sulfatizing roasting, and leaching the roasted residue with a selective solvent for the precious metal for dissolving the precious metal out of the residue.

3,969,108

RECOVERY OF GALLIUM

John James MacGregor, London, England, assignor to Johnson Matthey & Co., Limited, London, England

Filed Sept. 10, 1975, Ser. No. 612,025

Claims priority, application United Kingdom, Sept. 25, 1974, 41688/74

Int. Cl.² C22B *58/00*

U.S. Cl. 75—101 R 7 Claims

1. A process for the recovery of gallium from a particulate solid, which process comprises the following steps:

a. preparing a mixture of the solid with an excess of an alkali;

b. sintering the said mixture;

c. leaching the sintered product obtained with an aqueous solution;

d. cementation of the gallium present in the resulting aqueous solution with a metal more electropositive than gallium; and

e. collecting the gallium precipitate obtained by cementation.

3,969,109

OXIDATION AND SULFIDATION RESISTANT AUSTENITIC STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 12, 1974, Ser. No. 496,583

Int. Cl.² C22C *38/58*

U.S. Cl. 75—128 N 8 Claims

1. An austenitic stainless steel which in solution treated condition contains less than about 1% by volume of insoluble carbides, exhibits a weight loss of not greater than 0.400 grams per square decimeter at 1500°F by the 100 hour air-oxidation test described herein, a weight loss of not greater than 0.400 grams per square decimeter at 1700°F by the 90–10 sulfidation test described herein, a stress elongation of greater than 9500 psi for 1% stretch in 100 hours at 1500°F, and good resistance against stress corrosion cracking in halogen-containing environments, said steel consisting essentially of, by weight percent, from about 0.25 to about 0.45% carbon, about 0.01 to about 2.5% manganese, about 21 to about 30% chromium, about 2 to about 10% nickel, about 0.35 to about 0.55% nitrogen, about 0.10% maximum phosphorus, about 0.10% maximum sulfur, about 2% maximum silicon, and remainder iron, except for incidental impurities.

3,969,110

SOLDERING ALLOY FOR CONNECTING PARTS OF WHICH AT LEAST SOME ARE MADE OF ALUMINIUM

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Apr. 11, 1975, Ser. No. 566,991

Claims priority, application France, Apr. 18, 1974, 74.13565

Int. Cl.² C22C *11/08*

U.S. Cl. 75—166 C 3 Claims

1. Soldering alloy having a lead base for the soldering or soft brazing of parts of which at least one part is made of aluminum or aluminum alloy and another part is made of a heavy metal selected from copper,, brass, stainless steel and the like, comprising at least:

65 to 85 % lead in weight

12 to 30 % cadmium in weight

1 to 6 % antimony in weight 0.5 to 1 % tin in weight.

3,969,111

ALLOY COMPOSITIONS

Dennis S. Acuncius, Kokomo, and Steven J. Matthews, Greentown, both of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Mar. 27, 1975, Ser. No. 562,439

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 4 Claims

1. A cast alloy composition having high thermal stability and oxidation resistance up to about 1600°F., and high retention of ductility on aging consisting essentially of:

Mo	13.7% to 15.5%
Cr	14.7% to 16.5%
C	0.02% max.
B	Up to 0.015%
Mn	0.3% to 1.0%
Si	0.2% to 0.75%
Co	2.0% max.
Fe	3.0% max.
W	1.0% max.
P	0.02% max.
S	0.015% max.
Al	0.1% to 0.5%
Ni	Balance

said alloy having an Nv number between 2.23 and 2.31.

3,969,112

PROCESS FOR PREPARING SILVER-CADMIUM OXIDE ALLOYS

Han J. Kim, Chelmsford, and F. Joseph Reid, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 11, 1974, Ser. No. 521,609

Int. Cl.² B22F *8/00*, *3/00*; C22C *1/04*, *28/00*

U.S. Cl. 75—206 13 Claims

1. A method for preparing a silver-cadmium oxide alloy comprising forming a compact of silver particles, cadmium oxide particles and a density-increasing additive selected from the group consisting of the alkali metal and alkaline earth metal salts of nitric acid; heating said additive-containing compact to a temperature below the final sintering temperature for a period of time sufficient to decompose said additive; and then sintering said heated compact to form a silver-cadmium oxide alloy having improved sintered density as compared to alloys prepared without said additive.

3,969,113

PHOTOSENSITIVE BINDER LAYER FOR XEROGRAPHY CONTAINING TITANIUM OXIDE AND A CADMIUM PIGMENT

Hajime Miyatuka, Asaka, Japan, assignor to Rank Xerox Ltd., London, England

Division of Ser. No. 193,483, Oct. 28, 1971. This application July 23, 1973, Ser. No. 381,819

Int. Cl.² G03G *13/10*

U.S. Cl. 96—1 LY 14 Claims

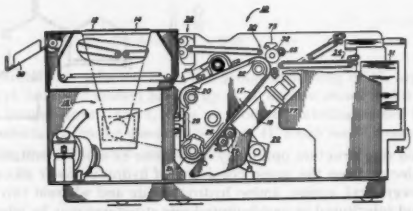
1. In a method for obtaining continuous tone xerographic reproduction by liquid developing an electrostatically charged and exposed photoconductive binder layer, the improvement comprising utilizing as photoconductive binder layer a particulate mixture essentially comprising titanium oxide and cadmium pigment in a film forming electrically insulating organic resin, the ratio of titanium-to-cadmium pigment being 50:50 to about 99.5:0.5 by weight and the weight ratio of pigment-to-resin binder ranging from about 2:1 to 15:1.

3,969,114

METHOD FOR MONITORING COPY QUALITY

Danny J. Prats, Sodus, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 382,808, July 26, 1973, Pat. No. 3,894,799. This application Nov. 29, 1974, Ser. No. 527,985
Int. Cl.² G03G 13/14; B05B 5/02; G01B 11/00
U.S. Cl. 96—1.4 4 Claims



1. The method of operating a copying machine of the type having a photoconductive member in which the images of the original being copied are developed, a transfer roller cooperable with the photoconductive member to transfer the developed image to copy sheets, and feeding means for feeding copy sheets along a preset path to said transfer roller for transfer of the developed images thereto, comprising the steps of:

developing a test image on said photoconductive member for use in testing developer activity,

transferring the test image directly to the transfer roller, outside said copy sheet preset path and

monitoring the test image on the transfer roller to determine image quality.

3,969,115

GRAPHICS PROCESS USING A COMPOSITE OF COLOR SEPARATED NEGATIVES

Salvatore P. Savia, West Islip, N.Y., assignor to RCS Color Labs, New York, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,943
Int. Cl.² G03C 7/16, 5/04
U.S. Cl. 96—14 8 Claims

1. A method of making a primary color separated negative of improved sharpness, clarity, texture and definition suitable for use in printing which comprises

a. making a primary color separated negative on panchromatic film of the image to be printed;

b. making a separated primary color positive on panchromatic film from the separated color negative;

c. making a reversal primary color positive from the separated color positive on direct reversal film so as to produce a panchromatic primary color separated reversal positive; and

d. making a primary composite color separated negative from the separated color positive and the primary reversal positive.

3,969,116

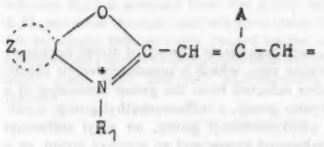
SILVER HALIDE PHOTOGRAPHIC SENSITIVE ELEMENT FOR FLASH EXPOSURE

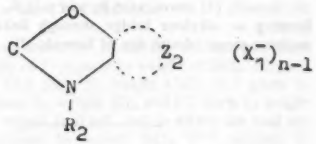
Keisuke Shiba, and Seiiti Kubodera, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 219,047, Jan. 19, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 525,036
Claims priority, application Japan, Jan. 19, 1971, 46-1320
Int. Cl.² G03C 5/04, 1/14
U.S. Cl. 96—27 E 9 Claims

1. A photographic process which comprises exposing to a flash light a silver halide photographic light-sensitive element having at least a photographic silver halide emulsion layer which is characterized by containing at least a sensitizing dye I and at least a sensitizing dye II as a combination having a supersensitization function, for a time shorter than 1×10^{-3} seconds, and developing said photographic element, said sensitizing dyes I and II being selected from dyes of the structural formula below

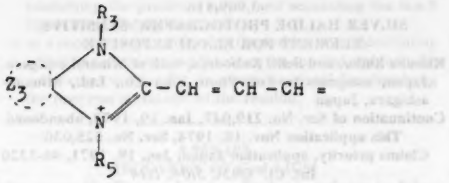
I.

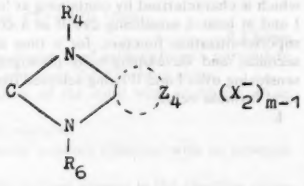




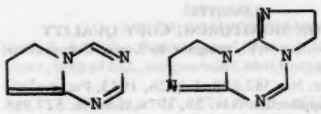
wherein Z_1 and Z_2 each represents a group of atoms necessary to complete a benzene ring, which is unsubstituted or substituted with a member selected from the group consisting of a lower alkyl group, a halogen atom, a phenyl group, a hydroxyl group, an alkoxy group of from 1 to 4 carbon atoms, a carboxyl group, an alkoxycarbonyl group, an alkyl sulfamoyl group, an alkylcarbamoyl group, an acetyl group, a cyano group and a trifluoromethyl group, or a group of atoms necessary to complete a naphthyl ring; wherein R_1 and R_2 each represents a member selected from the group consisting of an alkyl group of from 1 to 5 carbon atoms, a substituted alkyl group having a carboxyl group, a substituted alkyl group having a sulfo group, an allyl group, and a substituted alkyl group, commonly employed as a N-substituent of a conventional cyanine dye; wherein A represents a member selected from the group consisting of a methyl group and an ethyl group; wherein X_1^- represents an acid anion employed in common cyanine dyes; and wherein n represents an integer of 1 to 2, with the proviso that n is 1 in the case where said dye contains a betaine moiety;

II.

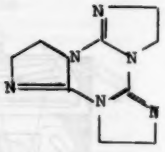




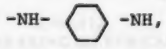
wherein Z_3 and Z_4 each represents a group of atoms necessary to complete a benzene ring, which is unsubstituted or substituted with a member selected from the group consisting of a halogen atom, a cyano group, a trifluoromethyl group, a carboxyl group, an alkoxycarbonyl group, an alkyl sulfamoyl group, an alkyl carbamoyl group and an acetoxy group, or a group of atoms necessary to complete a naphthyl ring; wherein R_3 and R_4 each represents a member selected from the group consisting of an alkyl group, an allyl group, and a substituted alkyl group commonly employed as a N-substituent of a cyanine dye; wherein R_5, R_6, X_2^-, and m, respectively, each are defined in the same manner as R_1, R_2, X_1^- and n in the formula (I) above, said R_5 and said R_6 further capable of forming an alkylene bridge through linkage to the alpha-methine group of said dye of formula (II).



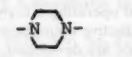
and



said ring structure optionally having one or more substituents selected from the group consisting of hydroxy, lower alkoxy, lower alkyl, amino, amino hydrochloride and wherein two of said substituted or unsubstituted ring structures may be joined together by a group selected from —NH—$(CH_2)_x$NH— wherein $x = 2$ to 6,



and



and a polyalkylene oxide derivative selected from the group consisting of the condensation products of alkylene oxides with water, aliphatic alcohols, aliphatic thioalcohols, glycols, fatty acids, amines, phenols, thiophenols and hexitols.

3,969,117

LITHOGRAPHIC DEVELOPING PROCESS UTILIZING A SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING HYDROIMIDAZO-S-TRIAZINE AND POLYALKYLENE OXIDE DERIVATIVE

Hidemaru Sakai, 940-18 Utsuki-cho, Hachioji, Tokyo, and Shigeji Baba, 1017, Sagamidai, Zama, Koza, Kanagawa, both of Japan

Continuation of Ser. No. 280,713, Aug. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 72,501, Sept. 15, 1970, abandoned. This application June 11, 1974, Ser. No. 478,397

Claims priority, application Japan, Sept. 22, 1969, 44-74675

Int. Cl.² G03C *5/20*

U.S. Cl. 96—66 R **3 Claims**

1. A process for lithographically developing a silver halide photographic material which has been imagewise exposed to light comprising developing said material with a lithographic developer comprising formaldehyde, sodium sulfite and hydroquinone as the sole developing agent, wherein the photographic material contains in at least one of the emulsion-layer and the layers adjacent thereto at least one hydroimidazo-s-triazine compound having at least one ring structure selected from the group consisting of

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3,969,118

LIGHT-SENSITIVE O-QUINONE DIAZIDE CONTAINING COPYING LAYER

Paul Stahlhofen, Wiesbaden, and Rainer Beutel, Florsheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed June 17, 1974, Ser. No. 480,226

Claims priority, application Germany, June 20, 1973, 2331377

Int. Cl.² G03C *1/54*; G03F *7/08*

U.S. Cl. 96—91 D **3 Claims**

1. In a light-sensitive supported copying composition in layer form containing an ester or an amide of an o-naphthoquinone diazide sulfonic acid or carboxylic acid together with an organic dyestuff and which changes its color shade upon exposure to actinic light, the improvement that it contains, calculated on its total content of o-naphthoquinone diazide compounds, 10 to 75 percent by weight of a halide of o-naphthoquinone diazide-4-sulfonic acid and, as the dyestuff, a compound selected from the group consisting of triphenyl methane dyes, azine dyes, and anthraquinone dyes in a quantity of 1 to 50 percent by weight, calculated on its total content of o-naphthoquinone diazide compounds.

3,969,119
PHOTOREACTIVE COMPOSITIONS COMPRISING POLYMERS CONTAINING ALKOXYAROMATICGLYOXY GROUPS

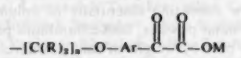
Thaddeus M. Muzyczko, Downers Grove, and Thomas H. Jones, Naperville, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Division of Ser. No. 267,475, June 29, 1972, Pat. No. 3,888,671. This application June 9, 1975, Ser. No. 585,215

Int. Cl.[2] G03C *1/68*

U.S. Cl. 96—115 R **18 Claims**

1. A light sensitive composition comprising a polymeric compound which includes as a recurring structure:



wherein R is selected from the group consisting of H, aryl, alkyl, halo and aralkyl having up to 10 carbon atoms and n is an integer from 1 to 18, Ar is an aromatic substituent and M is selected from the class consisting of H, alkali metal, ammonium and substituted ammonium.

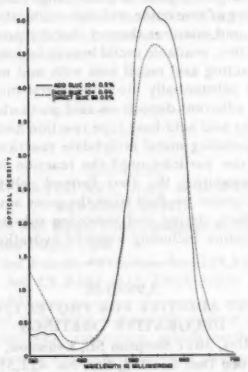
3,969,120
PHOTOGRAPHIC MULTICOLOR SCREEN ELEMENT AND METHOD FOR MAKING SAME

Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 319,905, Dec. 29, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,461

Int. Cl.[2] G03F *5/00*; **G03C** *1/84*

U.S. Cl. 96—118 **9 Claims**



1. A photographic multicolor screen element which comprises, in combination, a geometrically repetitive plurality of chromatic filter element series; at least one of said chromatic filter element series comprising filter elements comprising a hydrophilic colloid dyed with an acid triphenyl methane dye and a phthalocyanine dye containing at least two sulfonic acid groups.

3,969,121
GLASS COMPOSITIONS AND FIBERS MADE THEREFROM

Alan W. Atkinson, Rochdale, England, assignor to TBA Industrial Products Limited, Manchester, England

Continuation-in-part of Ser. No. 441,984, Feb. 13, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,988

Claims priority, application United Kingdom, Feb. 14, 1973, 7151/73

Int. Cl.[2] C03C *13/00, 3/04*; **C04B** *31/06*

U.S. Cl. 106—50 **21 Claims**

1. A glass composition, having improved chemical resistance to alkali attack, consisting essentially of:

from 50 to 75 percent by weight Silica
from 10 to 25 percent by weight R_2O
from 1 to 15 percent by weight Titania
from 1 to 20 percent by weight Zirconia
from 0.8 to 20 percent by weight Rare Earth Oxide
from 0 to 20 percent by weight Boric Oxide
from 0 to 10 percent by weight R^1O
from 0 to 1 percent by weight Fluorine (as fluoride)
from 0 to 2 percent by weight Al_2O_3
from 0 to 1 percent by weight P_2O_5
from 0 to 1 percent by weight Chlorine (as chloride)

wherein R_2O is selected from the group consisting of Na_2O, K_2O, mixtures thereof, and mixtures thereof containing up to 5% by weight lithium oxide (based on the total weight of the composition) and R^1O is selected from the group consisting of MgO, CaO, BaO, and SrO, and mixtures of two or more thereof.

3,969,122
FORMULATION FOR PRODUCING SODA-LIME GLASS INCLUDING COAL ASH

Karl A. Miller, Denver, and Clement V. Fogelberg, Arvada, both of Colo., assignors to Tusco Engineering Co., Inc., Commerce City, Colo.

Filed Dec. 16, 1974, Ser. No. 533,387

Int. Cl.[2] C03C *3/04*

U.S. Cl. 106—52 **1 Claim**

1. A batch formulation for producing transparent glass, consisting essentially of 71.6 parts by weight of SiO_2, 2.2 parts by weight Al_2O_3, 10.8 parts by weight CaO, 14.7 parts by weight Na_2O, 0.7 parts by weight SO_3, and 0.2 parts by weight C, and 6 parts by weight coal ash, and in which the coal ash comprises 51.1 percent by weight SiO_2, 21.3 percent by weight Al_2O_3, 6.4 percent by weight Fe_2O_3, 8.2 percent by weight CaO, 0.9 percent by weight MgO, 5.7 percent by weight Na_2O, 1.2 percent by weight SO_3, and 1.1 percent by weight TiO_2.

3,969,123
REFRACTORY CERAMIC COMPOSITIONS AND METHOD FOR PREPARING SAME

Cressie E. Holcombe, Jr., Knoxville, and Margaret K. Morrow, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 548,940

Int. Cl.[2] C04B *35/66, 35/68, 35/70, 35/48*

U.S. Cl. 106—55 **6 Claims**

1. An article of manufacture comprising a sintered composition consisting of a solid solution of tungsten oxide in a concentration in the range of 27 to 69 mole percent tantalum oxide in a concentration in a range of 73 to 31 mole percent and up to about 33 ⁻ mole percent of a metal oxide selected from the group consisting of hafnium oxide, titanium oxide, zirconium oxide, vanadium oxide, niobium oxide, and molybdenum oxide, with said metal oxide being substituted for one of the tungsten oxide and the tantalum oxide said article being characterized by possessing a coefficient of thermal expansion in the range of about zero to about a negative 5.1×10^{-6} cm/(cm-°C) over a temperature range of about 20° to 1000°C.

3,969,124

CARBON ARTICLES

Wilford S. Stewart, Plainfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 11, 1974, Ser. No. 441,434
Int. Cl.² C04B *35/52, 35/54*
U.S. Cl. 106—56 9 Claims

1. A process for the manufacture of low porosity, high density shaped carbonaceous articles comprising: combining carbonaceous particles of predetermined particle size and particle size distribution with a polymeric resin binder, forming the resin binder and particles into a shaped article, curing the so shaped resin binder and particles and thereafter pyrolyzing the article so shaped and cured, said carbonaceous particles being selected from the group consisting of carbon, graphite and mixtures thereof and said particles having particle sizes ranging from about 100 microns to about 0.001 microns with about 50 wt. % of the carbonaceous particles finer than 10 microns in equivalent spherical diameter.

8. The method of preparing a shaped, carbonaceous article comprising:

a. combining carbonaceous particles with from about 20 to about 25 wt. % of a phenolic resin binder, said carbonaceous particles having equivalent spherical diameters less than about 100 microns and with from about 50 wt. % of said particles having equivalent spherical diameters finer than about 10 microns said carbonaceous particles selected from carbon, graphite and mixtures thereof;

b. forming the mixture of resin and particles into a shaped article; and,

c. treating the shaped article under conditions sufficient to cure the resin.

3,969,125

HEAT RESISTIVE AND REINFORCED COMPOSITE MATERIAL

Katsutoshi Komeya, Kawasaki; Hiroshi Inoue, Kawaguchi, and Akihiko Tsuge, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 169,821, Aug. 6, 1971, abandoned. This application July 23, 1973, Ser. No. 381,672
Claims priority, application Japan, Aug. 10, 1970, 45-69308
Int. Cl.² C04B *35/50*
U.S. Cl. 106—73.2 19 Claims

1. A method of producing heat resistive, reinforced articles formed of composite materials substantially consisting of fibrous crystals of trisilicon tetranitride and a matrix of nonmetallic compound of Si-X-Al-O-N system, wherein X is an element selected from the group consisting of Y, Sc, La, Ce and mixtures thereof, which comprises:

providing a powdered mixture consisting essentially of 70 to 90 weight percent of trisilicon tetranitride, 1 to 20 weight percent aluminum oxide and 5 to 20 weight percent of an oxide material selected from the group consisting of yttrium oxide, scandium oxide, lanthanum oxide, cerium oxide and mixtures thereof, the particle size of said powdered mixture being in the range from about 0.1 to 2.0 microns;

press-molding said powdered mixture into a shaped article with the addition of about 5 weight percent of a temporary binder based upon the weight of the mixed raw materials; and

subjecting the resultant shaped article in a non-oxidizing gas atmosphere to a further step of sintering at a temperature from about 1400 to 1900°C.

3,969,126

BRAZING MIXTURE FOR FORMING A CORROSION-RESISTANT VACUUM-TIGHT SEAL BETWEEN A CERAMIC BODY AND A REFRACTORY METAL

Norman C. Anderson, Foster City, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 330,376, Feb. 7, 1973, Pat. No. 3,918,922. This application Oct. 17, 1974, Ser. No. 515,731
Int. Cl.² C09K *15/04*
U.S. Cl. 106—290 6 Claims

1. A brazing mixture comprising a volatile vehicle in which is suspended a powdered mixture, said volatile vehicle consisting essentially of a methyl methacrylate based lacquer, and said powdered mixture consisting essentially of columbium powder and a second metal powder, said columbium powder constituting the major part by weight of said powdered mixture, and said second powder being selected from a class consisting of iron and nickel.

3,969,127

MOLYBDATE CORROSION INHIBITING PIGMENT AND METHOD FOR PREPARING SAME

Dennis R. Robitaille, Detroit; Mark S. Vukasovich, and Henry F. Barry, both of Ann Arbor, all of Mich., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 269,508, July 6, 1972, abandoned, which is a continuation of Ser. No. 365,697, May 31, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,593
Int. Cl.² C09C *1/02, 1/04*
U.S. Cl. 106—292 12 Claims

1. A method for the manufacture of a substantially nontoxic complex corrosion inhibiting pigment which comprises the steps of (1) dispersing a water-insoluble inert inorganic pigmentary sized solid particulate carrier in an aqueous carrier, (2) further dispersing a quantity of pigmentary sized molybdenum trioxide in said aqueous carrier to effect sufficient dissolution thereof to produce reactively available molybdate ions, (3) adding to said slurry and slurrying therein a metal oxide also in a pigmentary size range selected from the group consisting of zinc oxide, calcium oxide, strontium oxide, barium oxide and mixtures thereof thereby producing corresponding reactive, available metal ions in said aqueous carrier slurry, (4) reacting said metal ions with said molybdate ions to precipitate substantially insoluble metal molybdate compounds as an adherent deposit on said particulated inert carrier, continuing said acid-base type reaction and precipitation of the corresponding metal molybdate reaction products on said inert carrier particles until the reaction is substantially completed, separating the thus formed salt-free complex molybdated pigment product from the gross aqueous salt-free reaction medium, drying and removing substantially all the remaining moisture including water of hydration therefrom.

3,969,128

PIGMENT ADDITIVE FOR PROTECTIVE AND DECORATIVE COATINGS

Bhaskar Raj Urs, 3021 Simpson St., Evanston, Ill. 60201

Filed Dec. 6, 1973, Ser. No. 422,359
Int. Cl.² C09C *3/00*
U.S. Cl. 106—291 7 Claims

1. A protective coating composition for application to a substrate, said composition comprising an admixture of:

a paint composition; and

a plurality of fractured pieces of a hollow bubble having a wall thickness of one-half to ten microns, wherein said hollow bubble is treated with a leafing agent and then fractured into a plurality of fractured pieces, each of the plurality of fractured pieces having the leafing agent attached to only its convex surface, and the leafing agent being such as to enable the fractured pieces of material to migrate to the outer surface of the paint composition;

the untreated surfaces of each of the fragmented pieces inhibiting the fractured pieces from being removed from the outer surface of the coating composition when the coating composition is applied to the substrate.

3,969,129

METHOD OF PRODUCING INORGANIC PIGMENTS

Zinaida Alexandrovna Savenkova, ulitsa Frunze, 108, kv. 12; Dmitry Danilovich Logvinenko, ulitsa Kalinina, 5, kv. 5; Karl Lazarevich Tsantker, ulitsa Gogolya, 19, kv. 4; Oleg Porfirievich Shelyakov, ulitsa Kalinina, 5, kv. 100; Alexandra Pavlovna Manzhely, ulitsa Tsiolkovskogo, 43, kv. 53, all of Poltava; Gennady Grigorievich Bobrov, ulitsa Tolubkhina, 68, kv. 65, Yaroslavl; Genrikh Samuilovich Ioffe, ulitsa Pushkina, 18, kv. 31, Yaroslavl; Boris Vasilievich Mironov, ulitsa Chkalova, 60, kv. 57, Yaroslavl; Pavel Iosifovich Kestelman, ulitsa Chkalova, 51, kv. 53, Yaroslavl, and Galina Vasilievna Egorycheva, ulitsa Chkalova, 51, kv. 18, Yaroslavl, all of U.S.S.R.

Continuation of Ser. No. 485,105, July 2, 1974, abandoned, which is a continuation of Ser. No. 186,762, Oct. 5, 1971, abandoned. This application Aug. 18, 1975, Ser. No. 605,556

Claims priority, application U.S.S.R., Oct. 12, 1970, 1483630

Int. Cl.[2] B03C *1/02;* **C09C** *3/04*

U.S. Cl. 106—309 **2 Claims**

1. A method of producing inorganic pigments comprising the steps of: (a) generating a rotating electromagnetic field inside a reaction vessel having an inlet and an outlet opening, said electromagnetic field having an induction of at least 0.1 T; (b) introducing magnetically soft non-equiaxial ferromagnetic particles into the reaction vessel within the zone of said electromagnetic field; (c) passing a continuous flow of a solution of a salt of a metal selected from the group consisting of lead, iron, copper and titanium through the zone of the rotating electromagnetic field, thus forming a pigment precipitate; (d) subjecting the precipitate to the rotating electromagnetic field to destroy the ion crystalline lattice of the pigment so that additional crystallization centers are formed; and (e) recovering the pigment product.

3,969,130

CARBON-COATED ARTICLES AND METHOD OF MAKING SAME

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Feb. 5, 1973, Ser. No. 329,526

Int. Cl. B44d *1/12;* **C01b** *31/00*

U.S. Cl. 117—332 **10 Claims**

7. A method of making a pyrolytic carbon-coated article having improved wear resistance, which method comprises heating an appropriate substrate to a temperature about 1000°C. in a reaction zone, effecting deposition of pyrolytic carbon onto the surface of said heated substrate from an atmosphere containing a mixture of a hydrocarbon and an inert gas, after depositing at least about 0.003 inch of pyrolytic carbon, varying the composition of said mixture in said reaction zone without discontinuing deposition to provide a volatile compound containing a carbide-forming element in an amount sufficient to deposit an alloy of carbon and carbide, wherein said carbide constitutes between about 25 and about 80 volume percent, for time sufficient to deposit a wear-resistant layer, and then decreasing the amount of said volatile compound without discontinuing deposition so that the outermost portion of the coating contains no more than a minor amount of alloyed carbide.

3,969,131

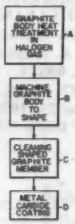
COATED GRAPHITE MEMBERS AND PROCESS FOR PRODUCING THE SAME

Elmer G. Fatzer, Brunswick, Ohio, and Cody P. Murphree, Decatur, Tex., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1972, Ser. No. 274,697

Int. Cl. B44d *1/20;* **C23c** *11/00*

U.S. Cl. 428—316 **14 Claims**



1. A composite structure comprising

a. a substrate comprising a fine grained isotropic graphite member of a density of at least about 1.75 gr./cc., of a coefficient of thermal expansion of the order of 7.5 to 8.3 inch per inch per °C×10^{-6}, in which the grains are of a maximum particle size of less than 0.001 inch, and characterized by a relatively uniform distribution of many interconnected fine pores of an average diameter of about 5 microns and less, the pores extending to the surface of the member, an ash content not exceeding about 10 ppm, and

b. a refractory metal carbide coating of a thickness of at least 0.1 mil firmly bonded to and conforming to the surface of the isotropic graphite member, said coating comprising at least one metal carbide selected from the group consisting of niobium carbide, zirconium carbide, titanium carbide, hafnium carbide, tantalum carbide, molybdenum carbide, and chromium carbide,

the refractory metal carbide coating and the isotropic graphite member having closely matching coefficients of thermal expansion.

3,969,132

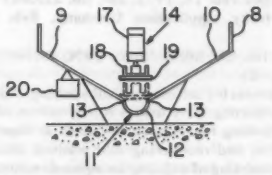
SELF-CLEANING WATER TABLE SYSTEM

Harry E. Anderson, Pittsburgh; Kenneth E. Helsel, Sewickley, and Raymond E. Heasley, McKees Rocks, all of Pa., assignors to Anderson Engineers, Inc., Carnegie, Pa.

Filed July 22, 1975, Ser. No. 598,063

Int. Cl.[2] B08B *3/00;* **F23J** *1/00*

U.S. Cl. 134—18 **17 Claims**



14. A method of cleaning a water table suitable for use in burning operations wherein waste material is precipitated upon a sloped bottom member of the table for movement into a drain channel having a part of the top length thereof open

and located at the lowermost portion of the sloped bottom member comprising:

A. closing the open top length of the drain channel against admission of waste material;

B. flushing the closed drain channel by forcing fluid under pressure through said channel; and

C. opening the drain channel to permit admission of waste material into the drain channel.

3,969,133

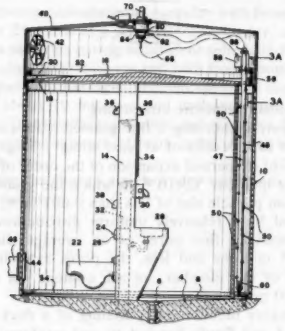
METHOD FOR SELF-CLEANING A RESTROOM

Gilbert T. McTighe, 804 N. Winsor St., Apt. 10, Mitchell, S. Dak. 57301, and Sture A. Johansson, Bunett Gardens Apt. 147, Kendall Park, N.J. 08824

Division of Ser. No. 140,227, May 4, 1971, Pat. No. 3,837,011. This application June 25, 1974, Ser. No. 483,081

Int. Cl.[2] B08B *3/02, 3/04*

U.S. Cl. 134—21 7 Claims



1. The method for cleaning a restroom, said restroom including an enclosure having at least one bathroom fixture mounted centrally therein, comprising: spraying the interior of said enclosure and all fixtures mounted therein with cleansing fluids by moving an elongated, vertical spray boom in a manner so as to generally track the interior periphery of said enclosure; draining said fluids out of said enclosure; evacuating from said enclosure vapors resulting from said spraying step; and passing heated drying air through said enclosure.

3,969,134

PROCESS FOR USING CLEAR RINSING AGENTS IN MECHANICAL DISHWASHING

Heimold Batka, Dusseldorf-Reisholz, and Theodor Altenschopfer, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed Feb. 11, 1972, Ser. No. 225,603

Claims priority, application Germany, Feb. 12, 1971, 2106819

Int. Cl.[2] B08B *30/00;* C07C *43/14*

U.S. Cl. 134—26 5 Claims

1. In the process for the mechanical washing of dishes which comprises subjecting dirty dishes to the action of a washing solution, subjecting the washed dishes to at least one clear-rinsing solution and recovering said washed dishes, the improvement consisting of utilizing an aqueous solution containing from 0.01 to 1.0 grams per liter of a clear-rinsing agent consisting essentially of (a) from 50% to 100% by weight of an adduct of first from 5 to 20 moles of ethylene oxide and then from 1 to 10 moles of propylene oxide to a secondary alkanol having a linear alkane chain of from 10 to 20 carbon atoms and (b) from 0 to 50% by weight of an adduct of from 5 to 10 moles of ethylene oxide to a secondary alkanol having a chain length of from 11 to 15 carbon atoms, as said at least one clear-rinsing solution.

3,969,135

LOW TEMPERATURE ALUMINUM CLEANING COMPOSITION AND PROCESS

Peter F. King, Farmington Hills, and Douglas D. Fekete, Warren, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 13, 1975, Ser. No. 549,644

Int. Cl.[2] C11D *1/72, 7/08*

U.S. Cl. 134—41 8 Claims

1. An aqueous acidic composition suitable for the low temperature cleaning of aluminum surfaces comprising both a first hydrocarbon derivative surfactant having the general formula:

$R(OR')_nOH$

and a second abietic acid derivative surfactant having the general formula:

$A(R'O)_nH$

wherein R is an alkyl or alkylaryl group of 8–22 carbon atoms; R′ is a divalent radical selected from ethylene, propylene and combinations thereof; each n is an integer from 7 to 22; and A is the abietic acid radical; said surfactants being present in amounts sufficient to remove both readily emulsifiable and difficult-to-emulsify oils.

5. The composition of claim 1, containing fluoride in an effective concentration of from 0.001 to 0.4 wt. %.

6. A process for cleaning an aluminum surface comprising contacting the surface with the composition of claim 1.

3,969,136

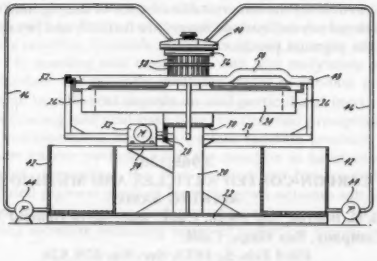
LIQUID TREATING APPARATUS

Peter Miskech, Warren, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Apr. 28, 1975, Ser. No. 572,166

Int. Cl.[2] B08B *3/02, 9/08*

U.S. Cl. 134—48 14 Claims



1. An apparatus for treating cup-shaped workpieces or the like comprising an outer housing defining a chamber adapted to be disposed in clearance-spaced relationship to the exterior surfaces of a workpiece and a conforming nozzle adapted to be disposed in telescopic clearance-spaced relationship to the interior surfaces of a workpiece defining in combination with the walls of a workpiece communicating radial and annular inner and outer fluid flow passages, a port formed in the inner end of said nozzle for discharging a pressurized fluid in impinging relationship against the interior bottom surface of a workpiece for radial flow outwardly of said radial passageway and sequentially through said annular inner and said annular outer passageways, supply means for supplying a pressurized fluid to said nozzle, said housing including a base portion formed with a discharge port disposed adjacent to the exterior bottom surface of a workpiece when disposed in said chamber for discharging fluid therefrom, deflection means on said base portion for deflecting fluid passing from said outer annular passageway in impinging relationship against the exterior

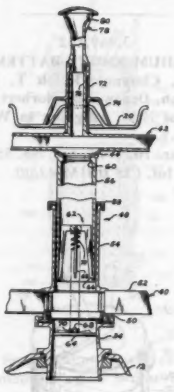
bottom surface of a workpiece, said housing including a section movable to and from an open position and a closed position for providing access to said chamber, and actuating means for moving said section between said open and said closed position for loading and unloading a workpiece therefrom.

3,969,137

CONDUIT FOR TRANSMITTING WASHING LIQUID TO AN UPPER SPRAY ARM IN A DISHWASHER

Thomas E. Jenkins, and Donald S. Cushing, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 25, 1975, Ser. No. 599,393
Int. Cl.² B08B 3/02
U.S. Cl. 134—176 **2 Claims**



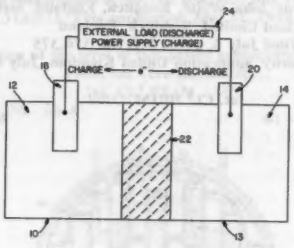
1. A dishwashing apparatus comprising a tub; upper and lower racks within said tub to receive articles to be washed, said racks being in vertical spaced relation; a first spray arm device disposed for rotational movement within said tub below said lower rack and a second spray arm device rotatably attached to said upper rack and disposed intermediate said upper and lower racks, each of said spray arm devices having orifices to discharge liquid against articles in said racks; said orifices of said first and second spray arm devices additionally being directed to induce said devices into rotation in response to water flowing therethrough; means for mounting said first and second spray arm devices for rotation relative to said racks; a telescoping conduit attached in flow communication and rotatable with said first spray arm device, extensible upwardly to said second spray arm device; means for supplying washing liquid to said first spray arm device through said telescopic conduit and to said second spray arm device; and means attached to said second spray arm device for mechanically receiving said telescopic conduit for transmission of liquid to said second spray arm device while rotating; and telescopically extensible stabilizing means within said telescopic conduit to stabilize said conduit during transmission of washing water therethrough said means for mechanically receiving said telescopic conduit being a downwardly convex-shaped hub and the telescopic conduit including a conforming end portion for association therewith; and said stabilizing means including a base and a double-arched member attached by a telescoping rod assembly, said base being attached within a lower tube of said telescopic conduit and the double-arched member being attached to an upper tube of said telescopic conduit for stabilizing thereof.

3,969,133

SODIUM-ALUMINUM HALIDE, SULFUR BATTERY

John Werth, Princeton, and Jack C. Sklarchuk, Trenton, both of N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed June 9, 1975, Ser. No. 585,021
Int. Cl.² H01M 43/00
U.S. Cl. 136—6 FS **6 Claims**



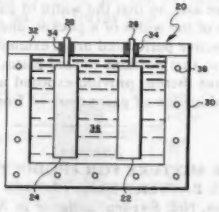
1. A secondary battery comprising in combination:
a. a molten sodium negative reactant;
b. a positive reactant comprising molten aluminum halide and molten sulfur;
c. a solid member separating the negative and positive reactants, said member being selectively ionically conductive to sodium cations;
d. a molten sodium halide-aluminum halide electrolyte on the positive reactant side of the solid member;
e. a carbon powder dispersed within the molten sodium halide, molten aluminum halide and molten sulfur; and
f. a current collector disposed in each the positive and negative reactants.

3,969,139

LITHIUM ELECTRODE AND AN ELECTRICAL ENERGY STORAGE DEVICE CONTAINING THE SAME

San-Cheng Lai, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 512,635, Oct. 7, 1974. This application Aug. 18, 1975, Ser. No. 605,691
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 LN **17 Claims**



1. A composite negative electrode structure for an electrical energy storage device having a lithium-containing electrolyte wherein said composite electrode structure comprises:
a supporting current-collecting matrix in intimate contact with an alloy of lithium and silicon, said lithium being present in said alloy in an amount from about 28 to 80 wt.% and said silicon being present in said alloy in an amount from about 20 to 72 wt.%.

8. An electrical energy storage device including a positive electrode and composite negative electrode structure spaced apart from one another and in contact with a lithium containing electrolyte wherein said composite negative electrode structure comprises a supporting current-collecting matrix in

intimate contact with an alloy of lithium and silicon, said lithium being present in said alloy in an amount of from about 80 to 28 wt.% and said silicon being present in said alloy in an amount of from about 20 to 72 wt.%.

3,969,140

ELECTRIC CELLS

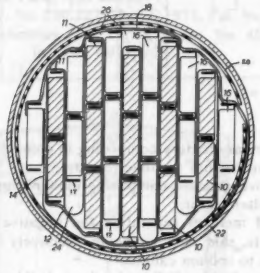
Charles Arthur John White, Redditch, England, assignor to Chloride Alcad Limited, Redditch, England

Filed July 5, 1973, Ser. No. 376,375

Claims priority, application United Kingdom, July 6, 1972, 31756/72

Int. Cl.² H01M 35/04

U.S. Cl. 136—14 **8 Claims**



1. An electric storage cell of a gas-tight type comprising: a gas-tight casing being at least partially cylindrical in shape; a plurality of flat rectangular positive and negative plates intercalated with one another in said casing and arranged in planes parallel to the axis of said casing, some neighboring plates being of the same width, the outer ones of said plates being narrower than the middle ones of said plates in a direction perpendicular to said axis so that their edges are stepped and substantially follow said partially cylindrical shape of said casing, the intercalation of such plates being asymmetrical so that at least at one edge such plates are not flush and at least at one edge one of said plates projects beyond the other so as to expose both an edge and a marginal portion of its face, and each of said plates being made of an integral number of standard size pocket-type plate members, each pocket extending parallel to the axis, so that the width of each plate is an integral multiple of the width of a pocket, and said pocket members having active perforated areas extending substantially to their edges, so that portions of said plates projecting beyond plates adjacent thereto provide exposed active areas for enabling recombination of gases evolved from adjacent plates.

3,969,141

POWDER MIXTURE FOR PRODUCTION OF LEAD STORAGE BATTERY ELECTRODES AND METHOD

Tore Eriksson, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Nov. 1, 1974, Ser. No. 520,123

Claims priority, application Sweden, Nov. 1, 1973, 7314902

Int. Cl.² H01M 4/36

U.S. Cl. 136—26 **16 Claims**

1. An isovolumetric powder mixture for the production of tubular lead storage battery electrodes comprising a mixture of lead and lead oxide as the active material and at least two non-lead additive compounds, one of said compounds comprising an oxide or salt of a metal, said compound being very slightly soluble in alkaline solution and being capable of reacting with sulfuric acid to produce a readily soluble sulfate.

2. An isovolumetric powder mixture for the production of tubular lead storage battery electrodes, said mixture comprising particles of lead, lead oxide, and at least two non-lead additive compounds, one of said additive compounds being magnesium sulfate and at least one of the remaining of said additive compounds comprising an oxide or a salt of a metal, said oxide or salt being very slightly soluble in alkaline solution, but being capable of reacting with sulfuric acid to produce a readily soluble sulfate.

13. A method for producing lead storage battery tubular electrodes which comprises:

a. placing a tubular sheath over an electrical conductor element;

b. filling the space between the conductor and the sheath with a powdered isovolumetric mixture containing lead, lead oxide, and at least two non-lead additive compounds, at least one of said compounds comprising a metal oxide or salt which is very slightly soluble in alkaline solution but is capable of reacting with sulfuric acid to produce a readily soluble sulfate; and

c. forming the electrode by subjecting the filled sheath to charging while immersed in an electrolyte.

3,969,142

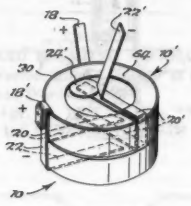
LITHIUM IODINE BATTERY

Wilson Greatbatch, Clarence; Ralph T. Mead, Kenmore; Frank W. Rudolph, Depew, and Norbert W. Frenz, North Tonawanda, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,101

Int. Cl.² H01M 43/00

U.S. Cl. 136—83 R **18 Claims**



1. A lithium-iodine cell comprising:

a. cathode means comprising a region of iodine-containing material having at least two surface portions and a current collector element in said material spaced from said surface portions;

b. cathode electrical conductor means operatively connected to said current collector element and extending from said cathode material;

c. first and second lithium anode elements, each of said lithium anode elements having a generally planar portion including opposite surfaces, one of the opposite surfaces of each of said elements operatively contacting said cathode material;

d. first and second anode holders embracing said first and second lithium anode elements, respectively, in a manner exposing the one surface of said first and second lithium element, respectively, to said cathode material, each of said holders being generally cup-shaped having a base portion and a rim portion, the other surface of each lithium element facing said base portion, said first holder having a perimeter smaller than the perimeter of said second holder, a portion of the rim of said first holder being received within the rim of the second holder;

e. said cathode material being contained within said holders and said cathode electrical conductor means extending between said rims of said holders and outwardly therefrom;

f. separator means of insulating material between said rims of said holders and embracing a portion of said cathode

electrical conductor means for insulating said cathode conductor from said lithium anode elements; and

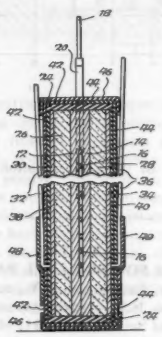
g. anode electrical conductor means operatively connected to said lithium anode elements.

3,969,143

ENCLOSURE FOR LITHIUM-IODINE CELL AND METHOD OF MAKING THE SAME

Ralph T. Mead, Kenmore; Norbert W. Frenz, North Tonawanda, and Frank W. Rudolph, Depew, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed July 22, 1975, Ser. No. 597,976
Int. Cl.² H01M 4/36
U.S. Cl. 136—83 R 16 Claims



1. An enclosure for a lithium-iodine cell comprising:

a. a frame of a material which is non-reactive with iodine and being open at opposite ends thereof, said frame containing a lithium-iodine cell comprising a lithium anode, iodine-containing cathode material and a lithium-iodine electrolyte said frame having a cross sectional shape conforming with the peripheral shape of said lithium anode;

b. first and second closure elements on said opposite ends of said frame, said closure elements sealing the open ends of said frame and peripheral portions of said elements being folded onto the peripheral surface of said frame with the terminal edges of said elements being in substantially abutting relation; and

c. a band of iodine impermeable material overlying the edges of said closure elements and embracing said frame.

11. A method of enclosing a lithium-iodine cell comprising the steps of:

a. providing a frame which has a continuous peripheral side surface defining a cross sectional shape and which is open at each opposite end;

b. placing a lithium anode in said frame in a manner separating the interior of said frame into two distinct regions each between a surface of said anode and a corresponding open end of said frame the cross sectional shape of said frame conforming with the peripheral shape of said lithium anode;

c. introducing iodine-containing cathode material into each of said regions and placing a cathode current collector in operative contact with said material in each of said regions;

d. placing a sheet element against said frame at each end thereof in a manner closing said frame at each end and sealing said sheet elements to said frame; and

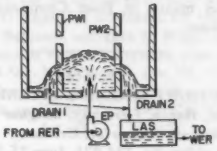
e. applying a band of iodine impermeable material over said peripheral surface of said frame and onto a portion of each of said sheet elements and sealing said band in place.

3,969,144

ELECTROCHEMICAL POWER GENERATION

Solomon Zaromb, 171 Clifton Ave., Newark, N.J. 07104

Continuation-in-part of Ser. No. 101,284, Dec. 24, 1970, Pat. No. 3,788,899, which is a continuation-in-part of Ser. No. 633,348, April 12, 1967, Pat. No. 3,554,810, which is a continuation of Ser. No. 354,084, March 23, 1964, abandoned, which is a continuation of Ser. No. 656,595, July 27, 1967, Pat. No. 3,513,031. This application Jan. 21, 1974, Ser. No. 434,910
The portion of the term of this patent subsequent to Jan. 12, 1988, has been disclaimed.
Int. Cl.² H01M 2/00
U.S. Cl. 136—86 A 14 Claims



1. A method for controlling power generation from an electrochemical battery formed from one or more cells having a consumable-metal anode, an oxygen- or hydrogen peroxide-depolarized cathode, a liquid electrolyte solution, an electrolyte reservoir, and circulation means for said electrolyte, wherein said method comprises the steps of:

a. introducing the electrolyte solution into the cell;

b. adjusting the level of the electrolyte solution in said cell to achieve a desired initial battery voltage output;

c. maintaining the temperature of the electrolyte below a maximum preset value of up to 50° centigrade; and

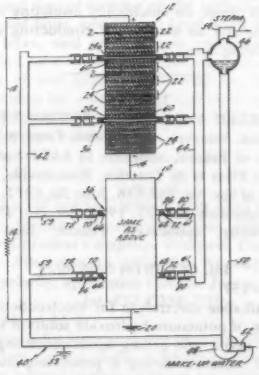
d. maintaining the desired battery performance by continual adjustments of said electrolyte level.

3,969,145

FUEL CELL COOLING SYSTEM USING A NON-DIELECTRIC COOLANT

Paul E. Grevstad, West Hartford, and Raymond L. Gelting, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 21, 1975, Ser. No. 597,613
Int. Cl.² H01M 8/04
U.S. Cl. 136—86 R 21 Claims



1. In a fuel cell cooling system including a stack comprising a plurality of cells connected electrically in series said stack

connected electrically to ground and electrically conductive separator plate means disposed between each pair of adjacent cells, an improvement to said stack comprising:

at least one of said separator plate means including passageways formed therein parallel to the plane of said plate means;

cooler means for carrying an electrically conductive coolant between said cells and including a plurality of cooler tubes disposed in said passageways and passing through said plate means, said tubes comprising electrically conductive wall means;

a dielectric material disposed between said electrically conductive plate means and said electrically conductive wall means adapted to provide an electrical barrier between said plate means and said wall means and Coolant circulation means in fluid Communication with said cooler means.

3,969,146

GAS-TIGHT SEALED GALVANIC CELL

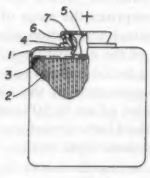
Werner Tietze, Hagen, Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Continuation of Ser. No. 374,071, June 27, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,174

Claims priority, application Germany, July 19, 1973, 2235299

Int. Cl.² H01M *2/04*

U.S. Cl. 136—133 **3 Claims**



1. A gas-tight, liquid-tight, cylindrical galvanic cell comprising a cylindrical, cup-shaped container, the open end of which is bent over thereby forming a cover having an opening coaxial with the cylindrical container, a collar formed on the cover, the collar extending above and away from the cover of the container and being of smaller diameter than the container, said cover and said collar formed by re-shaping said cylindrical cup-shaped container as a unitary single structure free of joints and seals between said cover and said container and said collar and said cover, an electrically insulating ring force-fit onto the collar and an electrically conducting cap force-fit onto the insulating ring.

3,969,147

GELLED ALKALINE ELECTROLYTE

Pierre Croissant, Smarves, and Rolande Coudrin, Antogny-le-Tillac, both of France, assignors to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

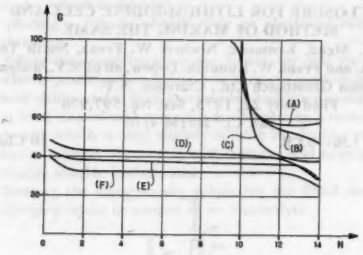
Continuation of Ser. No. 268,016, June 30, 1972, abandoned. This application July 25, 1974, Ser. No. 491,751

Claims priority, application France, June 30, 1971, 71.24030

Int. Cl.² H01M *6/06, 6/22*

U.S. Cl. 136—157 **13 Claims**

1. Gelled alkaline electrolyte for electrochemical generators consisting of potassium hydroxide solution together with added gelling agent, said gelling agent consisting of mixtures of reticulated starches having a processing index of from 25–50 and native starches, and said processing index of said reticulated starches being ascertained from a mixture of 5 grams thereof with 100 cc of water at approximately 100°C. that will after a 24 hour rest period settle a volume of from 25 to 50 cc of said reticulated starches, said electrolyte viscosity



being independent of the concentration of said potassium hydroxide therein.

3,969,148

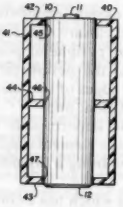
ADAPTER FOR DRY CELL BATTERIES

Burton C. Trattner, Hempstead, N.Y., assignor to Albert C. Nolte, Jr., Jericho, N.Y., a part interest

Continuation of Ser. No. 441,731, March 13, 1974, abandoned, which is a continuation of Ser. No. 321,610, Jan. 8, 1973, abandoned, which is a continuation of Ser. No. 135,289, April 19, 1971, abandoned. This application May 21, 1975, Ser. No. 579,632

Int. Cl.² H01M *2/10*

U.S. Cl. 136—173 **4 Claims**



1. In combination; a dry cell battery of a first nominal cross section and an adapter to render the battery interchangeable with a battery of a second, larger nominal cross section, said adapter comprising a body having a central passage opening at opposite ends thereof and constituting means for receiving a battery of said first nominal size insertable therein and removable therefrom from both ends of the body, said passage having the battery received therein and said body having at least two internal flanges projecting into said passage, radially innermost surfaces of said flanges being cylindrical and constituting means engaging and supporting said battery, the external transverse dimensions of the body being substantially similar to those of a battery of said second and larger nominal size.

3,969,149

THERMOELECTRIC MICROGENERATOR

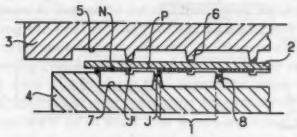
Pierre Thomas, Briis-sous-Forges, and Michel Alais, Orsay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 13, 1973, Ser. No. 396,706

Claims priority, application France, Sept. 13, 1972, 72.32442

Int. Cl.² H01L 35/02

U.S. Cl. 136—225 19 Claims



1. A thermoelectric microgenerator comprising a plurality of thermocouples connected in series, said thermocouples being formed by rows of alternately arranged positive and negative elements connected together to form a continuous conductor, said positve and negative elements being thin layers disposed on one side of a thin support, said thin support being an electrical insulating material and a poor heat conductor, a cold source having spaced projections disposed in thermal contact with alternate junctions of said thermocouples, and a hot source having spaced projections disposed in thermal contact with other alternate junctions of said thermocouples not in thermal contact with said projections of said cold source.

3,969,150

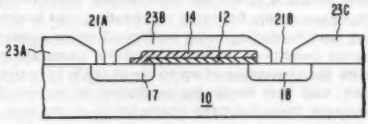
METHOD OF MOS TRANSISTOR MANUFACTURE

Robert L. Luce, Los Altos Hills, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 421,195, Dec. 3, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,445

Int. Cl.² H01L 21/265

U.S. Cl. 148—1.5 2 Claims



1. A method of manufacturing a semiconductor structure having spaced diffused regions for source and drain elements and a gate region therebetween, said gate region including an overlying electrode insulatively spaced therefrom and ohmically connected to one of said diffused regions, comprising the steps of:

a. forming an insulating layer over the surface of a semiconductor substrate including the area for said structure;

b. defining and etching a first opening in said insulating layer thereby exposing a first area of the surface of said substrate for a first of said diffused regions;

c. forming a layer of polycrystalline silicon over said insulating layer and within said first opening;

d. defining and etching said polycrystalline silicon layer over said first area thereby exposing a portion of said first area such that a portion of said polycrystalline silicon layer remains in contact with the surface of said substrate and the remainder of said polycrystalline silicon layer extends from said first area over said insulating layer adjacent to said first area;

e. defining and etching a second opening in said insulating layer adjacent to said polycrystalline silicon layer and spaced from said first area thereby exposing a second area of the surface of said substrate;

f. diffusing an impurity into the structure thereby rendering said polycrystalline silicon layer conductive as a gate electrode, and thereby forming said first and second diffused regions in said substrate beneath said first and second areas of the surface of said substrate, wherein said gate electrode is formed in ohmic contact with said first region.

3,969,151

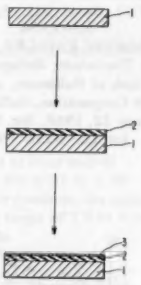
TREATMENT OF STAINLESS STEEL AND SIMILAR ALLOYS TO REDUCE HYDROGEN OUTGASSING

Eugene F. Hill, Belmont, and Jack L. Walls, Saratoga, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 436,557, Jan. 25, 1974, abandoned, which is a division of Ser. No. 318,139, Dec. 26, 1972, Pat. No. 3,833,430. This application Oct. 14, 1975, Ser. No. 622,301

Int. Cl.² C23F 7/02

U.S. Cl. 148—6.3 7 Claims



1. The method of treating a stainless steel article intended for use as a component of a vacuum system, said method consisting of the following two steps, namely

the first step of forming on the surface of said stainless steel article a first layer, said first layer comprising an oxidized form of said stainless steel and having a rate of permeation for hydrogen which is substantially less than the rate of permeation of hydrogen through said stainless steel, and

the second step of forming on the surface of said first layer a second layer, said second layer being distinct from said first layer, said second layer comprising a chemically reduced form of said first layer, the heat of adsorption for water of said second layer being less than the heat of adsorption for water of said first layer, said second layer exhibiting less hydrogen outgassing than the untreated stainless steel article.

3,969,152

RARE EARTH METAL RINSE FOR METAL COATINGS

Donald J. Melotik, Dearborn Heights, Mich., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 15, 1974, Ser. No. 461,185

Claims priority, application Canada, June 6, 1973, 173338

Int. Cl.² C23F 7/10

U.S. Cl. 148—6.15 Z 13 Claims

1. A process for increasing the corrosion resistance of conversion coated metal surfaces which comprises rinsing said conversion coated surface with an aqueous acidic solution consisting essentially of a rare earth metal salt, said solution having a molarity of at least 0.000001M and a pH adjusted to a value in the range from about 2.0 to about 6.5

3,969,153

METHOD OF MANUFACTURING A STAINLESS STEEL BOILER TUBE WITH ANTICORROSIVE COATING

Katsumi Suzuki, Hitachi; Toshio Kawakami, Mito, and Osamu Asai, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushika Kaisha, both of Japan

Filed Jan. 15, 1975, Ser. No. 541,115
Claims priority, application Japan, Jan. 18, 1974, 49-7847
Int. Cl.² C23F 7/04
U.S. Cl. 148—6.35 20 Claims

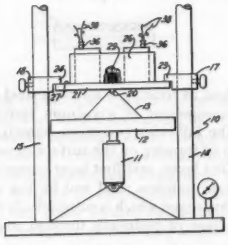
1. A method for manufacturing a stainless steel boiler tube with an anticorrosive coating comprising the steps of providing a boiler tube of a stainless steel selected from iron-chromium stainless steel with a chromium content of at least 9% and iron-chromium-nickel stainless steel containing iron as a major component and chromium and nickel as minor components, heat-treating at least a inner surface of said boiler tube under a steam environment at 500° to 1,100°C. until an anticorrosive coating having a thickness of at least 40 μ is formed and subsequently removing a Fe_3O_4 layer formed on the anticorrosive coating during heat treatment of said at least the inner surface of said boiler tube by subjecting the Fe_2O_3 layer to an exfoliating treatment.

3,969,154

CATASTROPHIC FAILURE OF METALS

William H. Collins, Timonium; Richard L. Blucher, and Edward R. Evans, both of Baltimore, all of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed June 22, 1960, Ser. No. 38,073
Int. Cl.² B23K 7/00
U.S. Cl. 148—9 R 10 Claims



1. A method of inducing rapid failure in a shape that is under stress and is composed of cold rolled steel comprising applying against a surface of said cold rolled steel shape a mixture composed of lithium metal, lithium chloride and potassium chloride, rapidly heating that mixture as well as the surface of the steel shape in contact therewith sufficiently to melt the mixture but below the annealing temperature of the steel, and maintaining that temperature until the steel shape cracks.

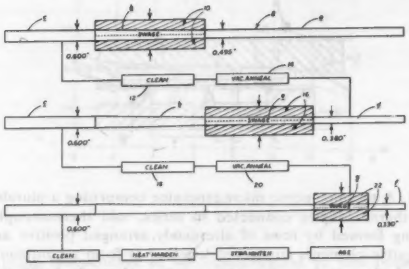
7. Apparatus for inducing catastrophic failure in a structural metal shape comprising means to apply a stress to a localized area of the surface of the shape, a material selected from the group consisting of alkali metals and alkaline earth metals together with an alkali metal halide, retaining means for maintaining that material at a surface opposite the application of stress therein, heating means extending about said material and its retaining means attached to raise the temperature of said material at least to its melting point and to maintain that temperature for a short period of time.

3,969,155

PRODUCTION OF TAPERED TITANIUM ALLOY TUBE

James F. McKeighen, Huntington Beach, Calif., assignor to Kawecki Berylco Industries, Inc., Reading, Pa.

Filed Apr. 8, 1975, Ser. No. 566,141
Int. Cl.² C21D 1/74, 1/80, 9/08; C22F 1/18
U.S. Cl. 148—11.5 F 6 Claims



1. In the manufacture of a length of tapered, alpha beta titanium alloy tube, the method comprising

shaping by cold working part of a length of a cylindrically shaped tube which is in an annealed state to produce a tapered portion in the length of tube with work hardening of said portion, and to leave a remainder portion in said length of tube substantially unworked and in an annealed state, and heat hardening the length of tube including said tapered portion and said remainder portion of said length of tube by heating said portions at an elevated temperature which is below the beta transus temperature with rapid quenching following said heating, said heating during heat hardening being performed under noncarbonaceous conditions where atmospheric gases are present with the absorption of up to about 0.4% by weight oxygen, said heat hardening producing an increased yield strength throughout the entire length of the tube which yield strength is substantially uniform.

3,969,156

METHOD OF MAKING DISPERSION STRENGTHENED PRODUCTS

Hans-Joachim Wallbaum, Osnabruck, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Apr. 23, 1975, Ser. No. 570,592
Int. Cl.² B23P 3/00; C22F 1/08
U.S. Cl. 148—11.5 R 10 Claims

1. Method of making dispersion-hardened objects, comprising the steps of:

providing a sheet or strip of metal amenable to dispersion strengthening;

punching disks from the sheet or strip;

annealing the disks or sheet or strip in an oxidizing atmosphere;

stacking the disks as a blank assembly; and extruding the blank.

3,969,157

METHOD OF PROVIDING DECARBONIZATION PROTECTION FOR METALLIC SURFACES

Klaus Hutterer; Walter Schwarz, and Ekkehart Krainer, all of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Aug. 6, 1974, Ser. No. 495,150
Claims priority, application Austria, Aug. 7, 1973, 6910/73
Int. Cl.² C21D *1/34*
U.S. Cl. 148—14 5 Claims

1. In a method of providing decarbonization protection of a metallic surface, particularly the surface of a ferrous material, during heat treatment thereof, wherein a boron-containing substance is deposited on the surface to form an adherent scale during the heat treatment step, and wherein the scale is removed after such heat treatment, the improvement wherein the depositing comprises the step of coating the surface to be protected with a thin paste-like substance prior to the heat treatment, said substance consisting essentially of from about 12 to about 80% of at least one boron-emitting material, an activator, and an aqueous binder, the maximum thickness of such coating being 1 mm, whereby the required decarbonization protection is provided without undesired hardening of the surface by significant infusion of boron atoms therein.

3,969,158

PROCESS FOR TREATING 9% NICKEL STEEL

Albert S. Holbert, Garland, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Aug. 10, 1972, Ser. No. 279,521
Int. Cl.² C23C *11/12;* C21D *6/04*
U.S. Cl. 148—16.5 3 Claims

1. The method of treating nine percent nickel steel comprising,

carburize selected surface areas at about 1600° to 1750°F. for sufficient time to obtain the desired case hardened properties and air cool,

normalize at about 1650° to 1750°F. for at least about one hour per inch of thickness and air cool,

again normalize at about 1450°F. for at least about one hour per inch of thickness and air cool,

temper at about 1100°F. for about 2 hours after the steel is uniformly hot and air cool,

surface harden selected carburized surfaces by heating them to about 1450° to 1525°F. and immediately air cooling such surfaces after they have reached the desired temperature,

subcool to at least about −120°F. for about 1 hour after the steel is uniformly cold and warm,

and temper at about 300° to 350°F. for about 2 hours after the steel is uniformly hot and cool.

3,969,159

CASTING POWDER

Heinz-Joachim Eitel, Lonsweg 58, 433 Mulheim, Germany

Filed Sept. 3, 1974, Ser. No. 502,797
Claims priority, application Germany, Sept. 6, 1973, 2344840
Int. Cl.² B23K *35/34;* C22B *9/10*
U.S. Cl. 148—26 9 Claims

1. A casting powder for steel casting consisting of a first casting powder component selected from the group which consists of silicon dioxide, aluminum oxide, calcium oxide, sodium carbonate, potassium carbonate, magnesium oxide, sodium oxide, and potassium oxide and a second casting powder component of titanium dioxide in a fluoride-free and borate-free composition.

3,969,160

HIGH-STRENGTH DUCTILE URANIUM ALLOY

Vernon C. Hemperly, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,368
Int. Cl.² C22C *28/00*
U.S. Cl. 148—32.5 3 Claims

1. A solution-treated age-hardened uranium alloy having high strength and ductility; consisting essentially of 0.7 to 0.8 weight percent titanium, 0.1 to 0.5 weight percent vanadium in an amount effective to inhibit titanium carbide growth with the balance being uranium.

3,969,161

CR-NI SYSTEM AUSTENITIC HEAT-RESISTING STEEL

Tohru Mimino, Tokyo; Kazuhisa Kinoshita, Yokohama; Takayuki Shinoda, Tokyo, and Isao Minegishi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 413,629, Nov. 7, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,225
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² C22C *38/48, 38/50*
U.S. Cl. 148—38 3 Claims

1. A Cr-Ni system austenitic heat-resisting steel consisting by weight substantially of

C: 0.05 to 0.30%,
Si: up to 1.0%,
Mn: up to 2.0%,
Cr: 15.0 to 26.0%
Ni: 7.0 to 22.0%, and at least one of
Ti: 0.01 to 0.8% and Nb: 0.01 to 1.7%

and further, in the above contents, the atomic ratio of C to Ti and/or Nb is within the range of 1.3 to 7, which is calculated by the following formula:

$$\text{atomic ratio} = \frac{\frac{\text{C wt\%}}{\text{C awt}}}{\frac{\text{Ti wt\%}}{\text{Ti awt}} + \frac{\text{Nb wt\%}}{\text{Nb awt}}} \quad \text{or}$$

$$\frac{\frac{\text{C wt\%}}{\text{C awt}}}{\frac{\text{C wt\%}}{\text{C awt}}} \quad \text{or}$$

$$\frac{\frac{\text{Ti wt\%}}{\text{Ti awt}}}{\frac{\text{Nb wt\%}}{\text{Nb awt}}}$$

where:
wt% = weight %
awt = atomic weight

and the grain size of said steel is within the range of ASTM No. 3 to 8.

3,969,162

METHOD OF PRODUCING SILICON STEEL STRIP

Robert H. Henke, 4 Foxwood Drive, Pittsburgh, Pa. 15238

Division of Ser. No. 239,538, March 30, 1972, Pat. No. 3,843,422. This application Aug. 1, 1974, Ser. No. 493,531
Int. Cl.² H01F *1/04*
U.S. Cl. 148—111 3 Claims

1. The method of producing oriented silicon steel strip of improved physical properties having a silicon content in the range 2.5 to 4.0 percent comprising the steps of:

a. bringing hot rolled strip having a thickness in the range 0.060 to 0.150 inch following normalizing to a temperature below 1500°F. and above 600°F.,

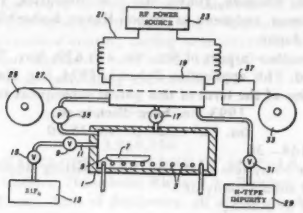
b. reducing the strip in thickness to final finish thickness prior to recrystallize normalizing to about 0.020 to 0.030 inch while in said temperature range 600°F. to 1500°F.,
c. normalizing at about 1725°F. to recrystallize grain strength, and
d. cold rolling to a selected thickness without further heating.

3,969,163

VAPOR DEPOSITION METHOD OF FORMING LOW COST SEMICONDUCTOR SOLAR CELLS INCLUDING RECONSTITUTION OF THE REACTED GASES

Gene Felix Wakefield, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 19, 1974, Ser. No. 507,329
Int. Cl.² H01L *21/205, 21/84, 31/00*
U.S. Cl. 148—174 **5 Claims**



1. A method of forming semiconductor grade silicon from lower grade silicon, which comprises the steps of:
a. providing a first chamber having at least a zone thereof maintained at a temperature below about 700° C,
b. passing a graphite fiber substrate through said zone,
c. passing a gaseous mixture of silicon difluoride and a suitable dopant into said first chamber including said zone whereby said silicon difluoride decomposes to pure silicon which deposits on said substrate and gaseous silicon tetrafluoride,
d. removing said silicon tetrafluoride from said first chamber,
e. providing a second chamber containing impure silicon,
f. heating said chamber to a temperature in the range of 750° to about 1200° C, and
g. passing silicon tetrafluoride, including at least a portion of the silicon tetrafluoride removed from said first chamber, into said second chamber to form additional silicon difluoride which is then introduced into said first chamber.

3,969,164

NATIVE OXIDE TECHNIQUE FOR PREPARING CLEAN SUBSTRATE SURFACES

Alfred Yi Cho, New Providence, N.J., and Joseph Charles Tracy, Jr., Romeo, Mich., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 506,346, Sept. 16, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,041
Int. Cl.² H01L *21/203, 21/306, 21/316*
U.S. Cl. 148—175 **1 Claim**

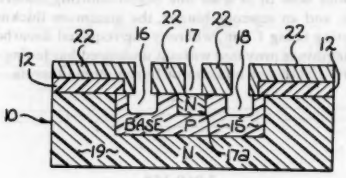
1. A method of preparing a gallium arsenide substrate surface for molecular beam epitaxy comprising the steps of: a) etch-polishing the substrate surface by submerging it in bromine-methanol; b) while said substrate is still submerged in said bromine-methanol, diluting said bromine-methanol with pure methanol effective to virtually stop the etching action of said bromine-methanol; c) while said substrate is still submerged in said methanol, forming a native oxide coating on said surface by diluting said methanol with deionized water; d) drying said substrate with a stream of dried freon effective to remove the water before any particulate matter contained therein can precipitate on the surface; e) mounting said substrate in an evacuable chamber of an apparatus adapted for molecular beam epitaxy; f) reducing pressure of said chamber; g) heating said substrate to a temperature sufficient to remove said native oxide coating; and h) growing at least one epitaxial layer on said substrate surface.

3,969,165

SIMPLIFIED METHOD OF TRANSISTOR MANUFACTURE

William B. Henderson, Marina Del Rey, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed June 2, 1975, Ser. No. 582,736
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **15 Claims**



1. A method for fabricating a semiconductor device having at least a first and a second active region comprising the steps of:
a. forming a plurality of separate openings in an insulating layer disposed on a surface of said semiconductor, said semiconductor having a preferential conductivity type and determining said first active region;
b. diffusing an impurity having an opposite conductivity type from that of said semiconductor through said plurality of separate openings in said insulating layer into separate upper regions in said semiconductor, said impurity determining a plurality of second active regions; and
c. selectively removing some of said second active regions such that at least one of said second active regions remains whereby said first active region and said remaining second active regions are exposed through said insulating layer.

3,969,166

ANTI-EROSIVE, SOLID ROCKET PROPELLANT COMPOSITIONS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,655
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **3 Claims**

1. In a solid propellant composition comprised of a binder selected from a carboxyl-terminated polybutadiene and a hydroxyl-terminated polybutadiene, a curative and crosslinking agent selected from an epoxy compound for said carboxyl-terminated polybutadiene and a curative and crosslinking agent selected from a diisocyanate compound for said hydroxyl-terminated polybutadiene, an oxidizer of a high solids loading of ammonium perchlorate, and an optional metal fuel, the improvement to reduce erosive burning which is achieved by incorporating into said solid propellant composition limited percentages from about 0.1 to about 1.0% of a silicate which reduces erosive burning which takes place during the burning phase of said solid propellant composition when said solid propellant composition is encased in a solid propellant rocket motor having a large length-to-diameter ratio, said silicate

selected from talc, kaolinite, kaolin, muscovite mica, and feldspar.

3,969,167

NITROCELLULOSE EXPLOSIVE PROCESS INVOLVING A KETONE

Gerald E. Johannes, 565 Frank Ave., SW., Huron, S. Dak. 57350

Continuation of Ser. No. 341,355, March 15, 1973, abandoned, and a continuation of Ser. No. 261,317, June 9, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,531

Int. Cl.² C06B 33/08

U.S. Cl. 149—38 7 Claims

1. The method of making an explosive composition suitable for use as a high explosive, and having a prolonged shelf life, improved temperature and weather resistance characteristics and improved ballistics properties which includes the steps of combining a nitrocellulose propellant having a nitrogen content of at least 12 percent with a lower alkyl ketone solvent in liquid form, the ratio of ketone to nitrocellulose by volume being in the range of from 1:8 to 100:8; blending said mixture in a non-aqueous environment for on the order of 1–24 hours and until the nitrocellulose dissolves and a homogeneous plastic or fluid mass is obtained; forming said mass to shape; and evaporating excess solvent from the resulting mass.

3,969,168

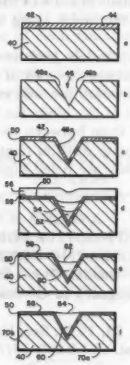
METHOD FOR FILLING GROOVES AND MOATS USED ON SEMICONDUCTOR DEVICES

Gregory L. Kuhn, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 446,834, Feb. 28, 1974, Pat. No. 3,892,608. This application Nov. 29, 1974, Ser. No. 528,363

Int. Cl.² H01L 21/306

U.S. Cl. 156—17 11 Claims



1. A method for filling an evacuated space on a substrate with an insulating filler;

providing a substrate having an upper surface and an evacuated space extending from said upper surface into the body of said substrate;

forming an undoped silicon dioxide layer on said upper surface including said evacuated space;

forming a highly P+ doped silicon layer on said upper surface including said evacuated space; and

etchably removing said highly P+ doped silicon dioxide layer positioned on said surface, and leaving said highly doped oxide within said evacuated space.

3,969,169

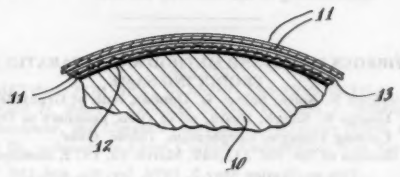
METHOD OF MAKING PAPER-INSULATED ELECTRICAL CONDUCTOR

Adrian Y. Santos, Jr., Yonkers, and Charles Feder, Riverdale, both of N.Y., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Continuation of Ser. No. 362,102, May 21, 1973, abandoned, which is a division of Ser. No. 256,896, May 25, 1972, Pat. No. 3,781,462. This application Apr. 11, 1975, Ser. No. 567,382

Int. Cl.² H01B 13/06, 13/16, 13/26

U.S. Cl. 156—56 3 Claims



1. In the manufacture of paper-insulated electrical conductor by wrapping the paper around the conductor in at least three lays to form an insulating sheath and subjecting the sheathed conductor to a drying operation to extract moisture from the paper, the improvement which comprises saturating the innermost paper lay with an emulsion which contacts the next outer lay prior to the drying operation but leaving at least one outer paper lay unexposed to the emulsion, said emulsion being inert except that it is self-setting and being non-metal-bearing and having adhesive properties, whereby said innermost lay is adhered to the next outer lay and a reinforcing film of the emulsion solids, remaining after the drying operation, is formed between the peripheral surface of the conductor and the innermost surface of the insulating sheath, and whereby said outer lay unexposed to the emulsion is free of adherence to the next inner lay and thus remains loosely formed around the conductor.

3,969,170

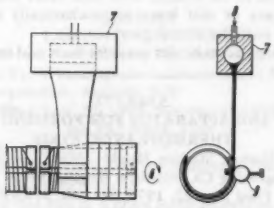
METHOD FOR MAKING A THERMOPLASTIC SLEEVE TO BE USED AS COUPLER FITTING FOR TUBES

Helmut Landgraf, Rumeln-Kaldenhausen, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Oct. 22, 1971, Ser. No. 191,875

Int. Cl.² F16L 13/02, 47/02

U.S. Cl. 156—158 16 Claims



1. Method of interconnecting two thermoplastic tubes or pipes, comprising:

providing a heating conductor coil in helical configuration and onto a mandrel, leaving spacing in-between the loops of the resulting helix;

extruding a thermoplastic ribbon wider than the spacing between the loops to cover several, more than two loops at once;

wrapping the ribbon as paid by the extrusion onto the coil as provided on the mandrel by causing the mandrel as carrying the coil to rotate at a speed faster than the speed of extrusion of the ribbon so that the ribbon is stretched as it is wrapped and in plural layers above as well as in-between the loops so as to obtain a coupler sleeve: inserting the tubes from opposite ends into the sleeve; and applying welding current to the coil thereby causing the ribbon material to soften and melt and the tensioned ribbon material fuses with the thermoplastic material of the tubes, the spacing between the loops of the coil permitting penetration of the ribbon material when softened upon heating of the sleeve by the coil.

3,969,171

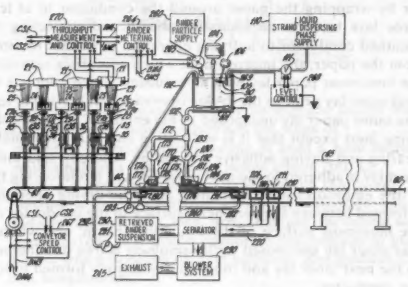
FIBROUS BODIES AND METHOD AND APPARATUS FOR PRODUCING SAME

Gerhard N. Bolen; Sidney G. Dunbar, both of Granville, and George E. Smock, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 233,549, March 10, 1972, abandoned. This application May 2, 1974, Ser. No. 466,439

Int. Cl.² B32B *17/02, 31/30*

U.S. Cl. 156—167 **23 Claims**



1. A method for selectively depositing binder in one layer of a multi-layer mat-like mass, comprising the steps of

a. depositing a plurality of successive layers of multi-filament strands on a collecting surface in a mat-like mass;

b. distributing binder particles throughout the mat-like mass, the binder particles having a mesh size with respect to the mesh size of the layers which enables circulation of the binder particles through the mat-like mass;

c. opening the strands in one of said layers to separate the filaments of the strands from each other and change the mesh size of that layer to mechanically entrap more binder particles therein; and

d. removing excess binder particles from said mat-like mass.

3,969,172

METHOD AND APPARATUS FOR FORMING JOINTS IN THERMOPLASTIC STRIP

Joseph G. Hotton, Sterling Heights, Mich., assignor to Neumann Engraving Co., Madison Heights, Mich.

Filed May 22, 1975, Ser. No. 579,955

Int. Cl.² B31F *3/00*

U.S. Cl. 156—211 **9 Claims**

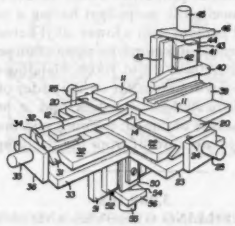
1. Apparatus for forming a joint in a strip of thermal plastic material having a notch, defined by laterally opposed notch walls, formed therein, comprising:

a pair of opposed jaws mounted for substantially rectilinear movement inwardly toward and outwardly, away from each other;

means for holding the strip between the jaws, with the notch substantially axially centered therebetween, whereby inward movement of the jaws toward each other compresses the strip portions adjacent the notch and causes the walls defining the notch to move together;

a thin heated blade arranged in a plane centrally between the jaws and aligned with the axis of the notch, said blade having opposed, generally parallel faces, and being movable in a direction generally perpendicular to the axis of movement of each of the jaws, and means for reciprocating the blade inwardly to a position between the jaws and outwardly to a position remote from the jaws for withdrawing the blade; and

means for (*a*) moving the jaws to engage the strip portions adjacent the notch and to press the notch walls against the opposite generally parallel faces of the heated blade for momentarily heating such walls, and (*b*) thereafter moving the jaws further toward one another after withdrawal of the heated blade to compress and hold the walls of the notch together until the faces thereof are joined.



7. A method for forming a joint in a strip of thermoplastic material, comprising the steps of:

forming a notch in the strip;

positioning the notch in alignment with a pair of opposed, axially movable compression jaws;

displacing a thin, heated blade generally perpendicular to the axis of movement of each of the compression jaws to a position within the notch along the central axis of the notch;

displacing the compression jaws toward each other and bending the strip about the apex of the notch to move the walls defining the notch towards each other and against the opposite sides of the blade for heating said walls;

removing the blade from between the walls; and then

placing the heated strip walls in contact and holding them in contact until they are fused together.

3,969,173

METHOD AND APPARATUS FOR FABRICATING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, Toledo, Ohio, and Ralph G. Amberg, Monticello, Ind., assignors to Owens-Illinois, Inc., Toledo, Ohio

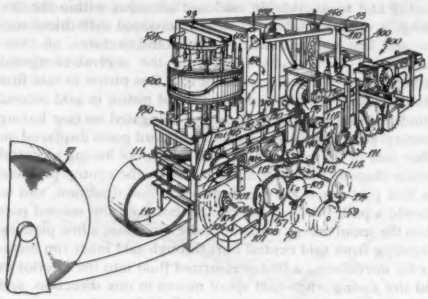
Filed Nov. 23, 1973, Ser. No. 418,562

Int. Cl.² B29D *23/10*

U.S. Cl. 156—218 **19 Claims**

1. The method of forming a sheet of thermoplastic material into a sleeve comprising the steps of: providing a continuous supply of thermoplastic sheet stock material; feeding said material along a processing path; severing said material into individual sheets having a leading end and a trailing end; serially introducing the leading end of each sheet into a hollow cylindrically shaped support; directing the sheet around the interior of said cylindrically shaped support perpendicular to the axis of said support and along an arc concentric with the axis thereof to form said sheet into a generally tubular shape with the trailing end portion overlapping the leading end portion and with surfaces on said trailing and leading end portions facing one another; moving each tubular sheet axially relative to said support; directing air from a heating means toward the facing surfaces of said overlapping trailing and

leading end portions as said sheet is moved past said heating means, whereby said air softens said facing surfaces; and forming a liquid-tight seam between said end portions by



pressing said overlapping trailing end portion and said leading end portion against one another to form a sleeve as said sheet is moved axially.

3,969,174

PLASTIC LAMINATE

Peter B. Kelly, Coshocton, and Donald G. Pucci, West Lafayette, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 20, 1974, Ser. No. 535,071
Int. Cl.² B44C *1/24*
U.S. Cl. 156—219 7 Claims

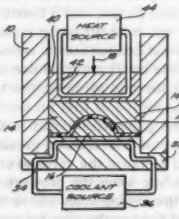
1. The process of improving the surface smoothness of decorative plastic laminates prepared by the heat and pressure consolidation without caul plates of at least one lay-up consisting consecutively from bottom to top surface of a plurality of thermosetting resin impregnated paper core sheets, a thermosetting resin impregnated print sheet and a thermosetting resin impregnated overlay sheet which improvement consists of placing at the surface of each laminate lay-up to be consolidated a sandwich consisting of a thermoplastic layer which melts or softens and flows at the consolidation temperature, and a release layer on either side of said thermoplastic layer.

3,969,175

METHOD OF MAKING A HEAT TRANSFERABLE MOLD SECTION

Richard Posner, East Northport, N.Y., assignor to Creative Polymer Products Co., Bayshore, N.Y.

Filed Oct. 15, 1974, Ser. No. 514,768
The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl.² B29C *1/04*
U.S. Cl. 156—221 9 Claims



1. The method of making a mold section for an object comprising the steps of making a cavity in a slab of metal, the size of said cavity being greater than the item to be molded, abutting a pre-etched surface of a sheet of plastic material which is flowable under heat and pressure against the surface of said cavity, at least one of said surfaces being initially coated with a heat activatable bonding agent, abutting a pattern of the object against the exposed surface of said sheet in said cavity, initially applying a sufficiently compressive force to said sheet via said pattern and said slab at a first temperature below the temperature for activating said heat activatable bonding agent for a period of time to permit said sheet to cold flow to its final surface whereby said sheet is deformed to conform to said pattern and thereafter applying heat with sufficient temperature to activate said heat activatable bonding agent to cause said sheet to adhere to said slab.

3,969,176

METHOD FOR HEAT SEALING POLYESTER FILM

Howard D. Bassett, Downers Grove; Franklin E. Schrage, Flossmoor, and George F. Kirkpatrick, Downers Grove, all of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 190,277, Oct. 18, 1971, Pat. No. 3,798,116. This application Dec. 18, 1973, Ser. No. 425,860
Int. Cl.² B32B *31/26, 31/28*
U.S. Cl. 156—251 6 Claims

1. A method for heat sealing superimposed layers of flexible, biaxially oriented, heat set polyester polymeric films, prepared from polyethylene terephthalic esters including the steps of:

a. superimposing a first ply of said flexible, biaxially oriented, heat set polyester polymeric film over a second ply of said polyester film each of said plies of film being characterized as having a tensile strength of at least about 15,000 psi and a ratio of transverse to machine direction tensile strengths between about 0.67 and 1.5;

b. clamping a portion of said plies of super-imposed film adjacent to and for at least the length thereof coextensive with the portion to be heat sealed so as to press the first and second plies of said film against each other and maintain the portion of said film to be heat sealed in a substantially untensioned state;

c. imposing on the portion of said superimposed plies of film to be heat sealed heat from a heat energy source of sufficient intensity for the time necessary to fuse in a bead type seal the portion of untensioned superimposed film; and

d. maintaining said plies of film pressed together until the source of heat energy is retracted therefrom.

3,969,177

LAMINATING METHOD

Donald E. Doran, New Milford, Pa., and Carl E. Samuelson, Johnson City, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 24, 1974, Ser. No. 482,055
Int. Cl.² H05K *3/00*
U.S. Cl. 156—288 8 Claims

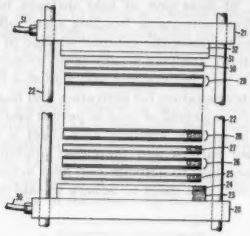
1. The method of laminating sheet pluralities into laminated panels comprising the steps of:

alternating stacking in a press layup pluralities of sheets of material having uncured heat curable adhesive thereon and other pluralities of said sheets of material and adhesive that have been partially cured to a laminate form, said sheet pluralities having therebetween at least one non-cohesive surface;

subjecting said stack of uncured and partially cured sheet pluralities to heat and pressure for a predetermined time to partially cure as newly formed laminates said uncured sheet pluralities and advance the cure of said partially

cured laminates; and

using said partially cured, newly formed laminates as alternate separators between other uncured sheet pluralities in a succeeding press layup.



3,969,178

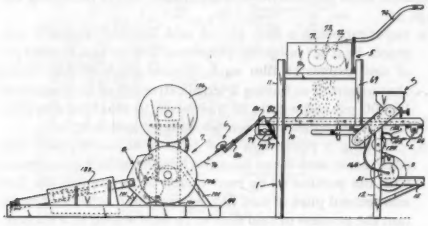
APPARATUS FOR MAKING A SHEET MOLDING COMPOUND

Richard L. Jeanson, Watertown, Wis., assignor to Menasha Corporation, Neenah, Wis.

Division of Ser. No. 329,524, Feb. 5, 1973. This application Jan. 20, 1975, Ser. No. 542,690

Int. Cl.[2] B65H *27/04*

U.S. Cl. 156—361 **23 Claims**



1. An apparatus for forming a composite structure, comprising means for moving a film of sheet material in a given path, resin supply means for depositing a coating of resin on the film as it moves in said path, fiber supply means for depositing a layer of fibers on the resin coating to provide a composite structure, said coating of resin and said layer of fibers being spaced from a side edge of said film, folding means for folding said side edge of the film partially over the coating of resin and the layer of fibers in a first fold, means for winding the composite structure in coiled form to provide a wound coil, and pressure means for applying pressure to the wound coil at a series of first locations spaced along the length of the wound coil to thoroughly impregnate the fibers and the resin.

3,969,179

CURING APPARATUS FOR RETREADING SYSTEM

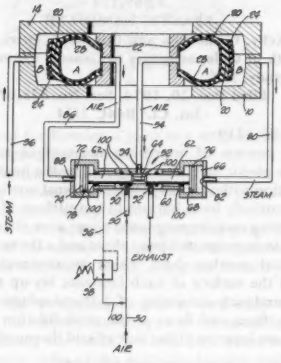
Herman J. Foegelle, Lodi, Calif., assignor to Lodi Division Intercole Automation, Inc., Lodi, Calif.

Continuation-in-part of Ser. No. 381,218, July 20, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 543,996

Int. Cl.[2] B29H *5/04*

U.S. Cl. 156—394 **6 Claims**

1. Apparatus for bonding a pre-cured strip of retread stock to the periphery of a tire casing, said apparatus comprising: at least one annular-shaped member defining a curing chamber for receiving the tire casing to be processed with the strip of retread stock extending around the periphery of the tire casing and in a position spaced radially inwardly from the inner peripheral surface of the chamber with the sides of the casing engaging the walls of the chamber to form a seal for the annular space between the strip and the inner peripheral surface of the annular-shaped member; an inner rim member for engaging the beads of the tire casing positioned within said annular-shaped member to hold the beads with a predetermined axial spacing and to provide an enclosed chamber within the tire casing; a valve including a central elongated cylindrical section and first and second cylindrical end sections, an elongated spool reciprocally slidable in the central elongated cylindrical section and connected to a first piston in said first cylindrical end section and to a second piston in said second cylindrical end section, said central elongated section having a central port therein and second and third ports displaced on either side of the central port, and said spool having a central section shaped to provide a path between the central port and the first port when the spool moves in one direction, and to provide a path between the central port and the second port when the spool moves in the opposite direction; a first pipeline extending from said central port through said inner rim member for introducing a first pressurized fluid into the interior of said tire casing when said spool moves in one direction, and for exhausting the first pressurized fluid from the interior of said tire casing when said spool moves in the opposite direction; a second pipeline extending through said annular-shaped member for introducing a second pressurized fluid at a relatively high temperature into the annular space between the tire and the inner peripheral surface of the annular-shaped member; a source of the first pressurized fluid coupled to the second port; an exhaust line coupled to the third port; a third pipeline extending through the annular-shaped member and coupled to the interior of the first cylindrical end section to introduce the second pressurized fluid from said annular space to one side of the first piston; and a fourth pipeline extending through said inner rim member and coupled to the interior of the second cylindrical end section to introduce the first pressurized fluid from the interior of said tire casing to one side of the second piston, thereby to cause the valve to couple the first pipeline to the source of first pressurized fluid when the pressure of the first pressurized fluid in the tire casing falls below the pressure of the second pressurized fluid in the annular space, and to cause the valve to couple the first pipeline to the exhaust line when the pressure of the first pressurized fluid in the tire casing rises above the pressure of the second pressurized fluid in the annular space, for maintaining a predetermined pressure differential between said first pressurized fluid in the interior of the tire casing and said second pressurized fluid in the annular space.



3,969,180

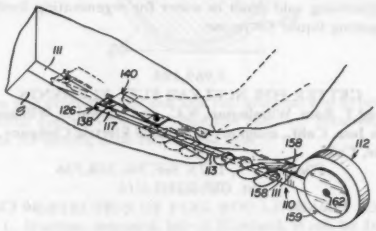
APPARATUS FOR LAYING DOWN A TAPE STRIP

Donald Ravesloot, 15646 S. Emerald Ave., Harvey, Ill. 60426

Continuation-in-part of Ser. No. 259,746, June 5, 1972, abandoned. This application May 17, 1974, Ser. No. 470,989

Int. Cl.[2] B32B *31/18*; B65H *35/10*

U.S. Cl. 156—523 20 Claims



1. Apparatus for applying to a surface a strip of flexible tape from a roll supply, comprising: an elongated handle defining opposite first and second ends and a through passage between said ends for conducting tape from said supply for application of the tape to a surface at said first end; means disposed at a position within said handle passage for partially separating thereat a distal portion of the tape applied to the surface from the tape strip within said handle passage; means on said handle first end for holding the partially separated distal portion against a surface to which it is to be applied; and manually operable means for selectively holding the supply portion of the partially severed tape strip in said handle passage against withdrawal movement to effect full separation of said distal portion therefrom as an incident of a concurrent holding of the tape strip by said holding means and movement of said handle first end away from the applied distal portion.

12. Apparatus for applying to a surface a strip of flexible tape from a roll supply, comprising: an elongated handle having a pair of spaced side walls defining an end of the handle and a through passage through said end for conducting tape from said supply for application of the tape to a surface at said handle end; means for separating a distal portion of the tape applied to the surface from the tape strip within said handle passage; and means for transversely adjusting the spacing of said side walls from a centerline of the handle end to provide accurate centered guiding of the tape strip as it is applied from said first end.

3,969,181

TRANSFER ADHESIVE DISPENSING DEVICE

Thomas W. Seabold, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 3, 1974, Ser. No. 475,662

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—577 6 Claims

1. A transfer adhesive dispensing device suitable for dispensing adhesive onto a substrate from a convolutely wound roll of transfer adhesive consisting of a web of adhesive, a release liner and a core having axially extending blind cavities terminating at edge walls, said device comprising:

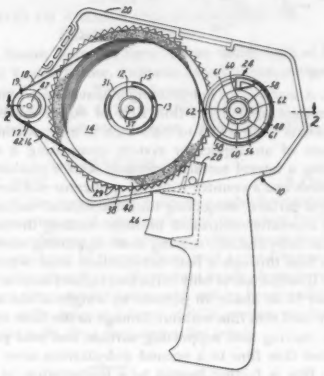
a housing;

an applicating roller mounted on the forward portion of said housing, a portion of said roller's periphery projecting beyond said housing;

a tape support rotatively mounted in said housing, said support having axially extending projection means engaging said core for interlocking engagement and for engaging edge walls of a said core thereby positioning said core with the axis thereof in a predetermined parallel spaced relationship to the axis of said roller and in a predetermined axial relationship to said tape support holding said adhesive and said liner on said core in alignment with respect to a predetermined axial portion of the surface of said applicating roller;

a takeup roller mounted in said housing for receiving and holding spent liner after said adhesive web has been applied to said substrate, said takeup roller being mounted in spaced parallel relationship to said applicating roller;

said roll of transfer adhesive being positioned from a said core about said applicating roller, with the liner engaging the applicating roller, then with the liner extending around the wound roll engaging the web of adhesive therein and then contacting said takeup roller;



drive means associated with said tape support and said takeup roller for transmitting rotational motion from said tape support to said takeup roller upon rotation of said tape support by rotation of said core during unwinding of said web of adhesive and application of said adhesive strip to said substrate, said takeup roller being simultaneously rotated in the opposite direction to increase the contact of the liner with the wound roll; and

brake means for stopping the rotation of the tape support and thereby said core, whereby when said device is pulled after said brake is applied, the adhesive applied to the substrate will be severed from the adhesive remaining in the device.

3,969,182

GROWTH OF MERCURIC IODIDE SINGLE CRYSTALS FROM DIMETHYLSULFOXIDE

Richard C. Carlston, San Luis Obispo, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 16, 1975, Ser. No. 596,547

Int. Cl.[2] B01D *9/02*; B01J *17/04*; C01G *13/04*

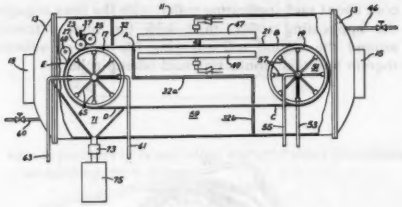
U.S. Cl. 156—621 9 Claims

1. A process for growing large euhedral tetragonal mercuric iodide single crystals comprising the steps of: forming a solution of mercuric iodide and dimethylsulfoxide, containing the thus formed solution in a vessel at a temperature in the range of about 20° to 80°C and in contact with air of 15 to 50% humidity which allows water to enter into the solution for a time period sufficient to form clear red crystals in the solution, and removing the thus formed crystals from the solution.

3,969,183
VACUUM DEHYDRATION OF HEAT SENSITIVE MATERIALS

James B. Redd, Clearwater, Fla., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Oct. 4, 1974, Ser. No. 512,631
Int. Cl.² B01D 1/22
U.S. Cl. 159—49 9 Claims



1. A method for dehydrating a heat sensitive material which comprises applying a thin film of liquid material having a thickness from 0.005 to 0.05 inch to a supporting surface, by means of an applicator system comprising a metering roll having a lateral surface provided with a plurality of annular grooves and a counter-rotating applicator roll having a smooth lateral surface, subjecting said thin film to vacuum conditions and carefully controlled uniform heating throughout subsequent dehydration, moving said supporting surface and said thin film through a first dehydration zone wherein said thin film is subjected to only sufficient radiant heat to remove from about 50 to about 90 percent by weight of the total moisture from said thin film without damage to the heat sensitive material, moving said supporting surface and said partially dehydrated thin film to a second dehydration zone wherein said thin film is further heated to a temperature in the range of from about 105°F. to about 210°F. to remove additional moisture without damage to the heat sensitive material, and then moving said supporting surface and the almost dry thin film to a third dehydration zone to effect further controlled dehydration of the almost dry thin film without damage to the heat sensitive material.

3,969,184
DIGESTION ODOR CONTROL

Karl Nicolaus Cederquist, Stockholm, Sweden, assignor to Defibrator AB, Stockholm, Sweden

Continuation of Ser. No. 484,779, July 1, 1974, abandoned, which is a continuation of Ser. No. 258,547, June 1, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,917
Int. Cl.² D21C 11/08
U.S. Cl. 162—19 3 Claims

1. Method of producing cellulosic pulp having a yield ranging between 65–90% from lignocellulosic material by digesting said material with a digesting liquor containing Na_2S and Na_2CO_3, said pulp and the by-products resulting from the digestion being substantially free from malororous constituents prior to withdrawal from the digesting process without the need for individual isolation and treatment comprising:

a. impregnating the lignocellulosic material with digesting liquor and digesting the impregnated material in a digester at a temperature ranging between 150°–190°C in vapor phase in an atmosphere of saturated steam corresponding to the digesting temperature;

b. thereafter cooling the digester with its total contents including solids, fluids, vapors and noncondensable gases to a temperature ranging between 120°–150°C by spraying cold oxidized spent liquor over the entire digester contents and introducing molecular oxygen into the digester at said temperature and under superatmospheric pressure for a time sufficient to obtain rapid oxidation of said total contents without decomposition of the pulp while substantially eliminating the malodorous constituents from the contents;

c. then discharging pulp and spent liquor from the digester and recovering the spent liquor from the pulp;

d. concentrating the recovered spent liquor by evaporation of water;

e. burning the concentrated spent liquor to yield a smelt consisting essentially of Na_2S and Na_2CO_3; and

f. dissolving said smelt in water for regenerating fresh digesting liquor for re-use.

3,969,185
GETTER FOR NUCLEAR FUEL ELEMENTS

Wilfred T. Ross, Wilmington, N.C., and Harold E. Williamson, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 9, 1973, Ser. No. 358,736
Int. Cl.² G21C 3/16
U.S. Cl. 176—68 40 Claims

1. A nuclear fuel element which comprises an elongated container, a body of nuclear fuel material disposed in and partially filling said container and forming an internal cavity, an enclosure integrally secured and sealed at each end of said container, and a composite getter disposed within said container, said composite getter being comprised of a metallic substrate having thereon a coating of a material capable of gettering reactive gases covering at least a portion of the substrate with the substrate having a greater thermal coefficient of expansion than the coating and being capable of producing tensile stress in said coating whereby said coating is intermittantly fractured by changes in temperature of said composite getter to thereby expose fresh gettering surfaces in said coating.

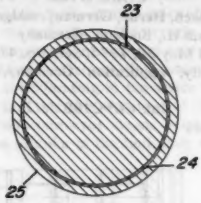
3,969,186
NUCLEAR FUEL ELEMENT

John R. Thompson, San Jose, Calif., and Trevor C. Rowland, Halden, Norway, assignors to General Electric Company, San Jose, Calif.

Filed Feb. 11, 1974, Ser. No. 441,131
Int. Cl. G21c 3/20
U.S. Cl. 176—68 1 Claim

1. A nuclear fuel element comprising: an elongated cladding tube having the form of a right circular cylinder and formed of a material from the group consisting of zirconium and zirconium alloy; a body of nuclear fuel material disposed in said container with an annular gap between said fuel material and said tube; a liner formed of a material from the group consisting of molybdenum and molybdenum alloy disposed in

said annular gap between said fuel material and said tube and partially filling said gap to provide an interaction barrier between said cladding tube and said fuel material and to provide an initial gap between said liner and said fuel material; and means for sealing each end of said tube.



3,969,187

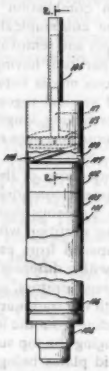
DETECTION OF FUEL ROD LEAKAGE

Dan L. Worlton, deceased, late of Richland, Wash. by June S. Worlton, administratrix, and Dan L. Robinson, Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 251,936, May 10, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,383

Int. Cl.² G21C *3/16*

U.S. Cl. 176—79 **5 Claims**



1. A fuel rod for use in a nuclear reactor which comprises:

a. a hollow longitudinal body containing nuclear fuel for producing fission product gases;

b. a lower end cap attached to and sealing the lower end of said body;

c. an upper end cap assembly attached to and sealing the upper end of said body, said assembly comprising:

i. end cap means extending longitudinally upward from said upper end and having a concave lower surface facing said fuel and including a first cavity extending upward from said lower surface and terminating in said end cap means above said upper end of said body,

ii. resilient, flexible means operably disposed in said hollow body below and in contact at its edges with said concave lower surface to form a second cavity between said concave lower surface and one side of said flexible means into which said resilient, flexible means can flex, and sealing at least said second cavity from the portion of said hollow body located below said flexible means, said flexible means being flat in its undistorted position, and

iii. rigid means operably in contact with the inner surface of said hollow body adjacent to said resilient, flexible means on the side thereof opposite said second cavity, said rigid means having at least one bleed hole which allows any gases developed in said hollow body to contact said flexible means, and

iv. contact means having at least a portion thereof normally located in said first and second cavities with one end in contact with said resilient, flexible means, said contact means being freely movable in said first cavity and inducing vibrations in said flexible means when said contact means is raised into said first cavity and thereafter dropped into contact with said flexible means whereby the frequency of said vibrations is a function of pressure applied to the opposite side of said resilient, flexible means.

3,969,188

METHOD OF PRODUCING GUANOSINE BY FERMENTATION

Hitoshi Enei, Zushi; Katsuaki Sato; Yasuo Anzai, both of Kawasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

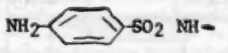
Filed Oct. 24, 1974, Ser. No. 517,631

Claims priority, application Japan, Oct. 24, 1973, 48-119749

Int. Cl.² C12D *13/06*

U.S. Cl. 195—28 N **5 Claims**

1. A method for producing guanosine which comprises culturing a guanosine-producing mutant of the genus Bacillus under aerobic conditions in an aqueous culture medium until guanosine accumulates in the medium, and recovering accumulated guanosine therefrom; the mutant being characterized by a requirement for adenine for growth and by being resistant to at least one sulfa drug at a level of 100 gamma per cubic centimeter, said sulfa drug containing the group



and having anti-microbial action which is suppressed at least in part by p-aminobenzoic acid.

3,969,189

CELL WALL-LYSING COMPLEX ENZYMES AND A PROCESS FOR THE PRODUCTION THEREOF

Reisuke Kobayashi, Shizuoka; Hironari Sato; Kiyoshi Takita, both of Shimizu, and Nobuo Toyama, Miyazaki, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,933, Dec. 14, 1972, Pat. No. 3,890,198. This application Nov. 8, 1974, Ser. No. 522,304

Claims priority, application Japan, Dec. 14, 1971, 46-100700; Jan. 27, 1972, 47-9486

The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.² C07G *7/028*; C12D *13/10*

U.S. Cl. 195—62 **10 Claims**

1. A powdery complex enzyme isolated from Pellicularia culture media, capable of lysing cell walls and having the following characteristics:

a. being active to lyse the cell walls of living cells and dead cells of *Aspergillus niger*, *Penicillium steckii*, *Saccaromyces cerevisiae*, *Candida utilis*, *Canadida albicans*, *Candida lipolitica*, *Lentinus edodes*, *Bacillus subtilis*, *Lactobacillus lactis* and *Chlorella*;

b. having cell wall-lysing activities stable in a pH range of 3 to 9, the optimum pH being in the range of 5 to 7;

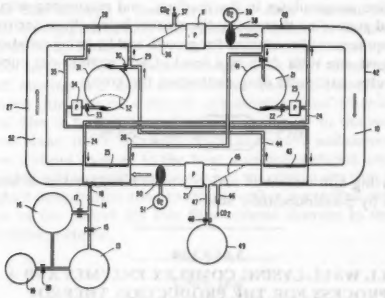
c. said cell wall-lysing activities being optimal in a temperature range of 30° or 40°C., but the optimum temperature varying depending on the nature of the microorganisms of which cells are to be lysed;

d. said cell wall-lysing activities being stable in a low temperature range but rapidly inactivated at a temperature of higher than 50°C.;
e. said cell wall-lysing activities being inhibited by the presence of Mn^{++}, Ni^{++} or Zn^{++};
f. exhibiting the enzymatic activities of cellulase and β-1,3-glucanase at an optimum temperature of 40°–50°C. and an optimum pH of 5.0, chitinase at an optimum temperature of about 35°C. and an optimum pH of 4.0–5.5, protease, hemicellulase and amylase; and
g. consisting essentially of component enzymes each having a molecular weight of at least 50,000.

3,969,190
APPARATUS AND METHOD FOR MICROBIAL FERMENTATION IN A ZERO GRAVITY ENVIRONMENT

Ralph E. Hise, Littleton, and Russell T. Jordan, Denver, both of Colo., assignors to Martin Marietta Corporation, Washington, D.C.

Division of Ser. No. 143,808, May 17, 1971, Pat. No. 3,769,176. This application Aug. 13, 1973, Ser. No. 387,641
Int. Cl. C12b 1/14
U.S. Cl. 195—142 12 Claims

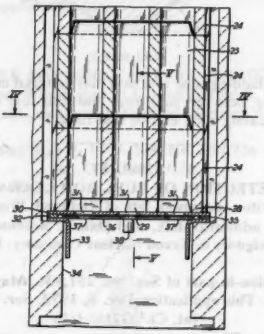


1. Apparatus for conducting the propagation and growth of micro-organisms in a substantially zero gravity environment and for the recovery of fermentation products therefrom comprising:
closed circulation loop fermenter means for containing a liquid culture suspension;
circulating means operably connected to said fermenter means for circulating said liquid culture suspension within said fermenter means;
means for supplying nutrients, said means including a nutrient reservoir and first dialysis means;
means for accumulating metabolic products from said fermenter means, said means including a metabolic product reservoir and second dialysis means;
means for introducing oxygen into said fermenter means;
means for removing carbon dioxide gas from said fermenter means; and,
means for collecting micro-organism cells and fermentation products from said fermenter means.

3,969,191
CONTROL FOR REGENERATORS OF A HORIZONTAL COKE OVEN

Gunther Bollenbach, Herne, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed May 30, 1974, Ser. No. 474,374
Claims priority, application Germany, June 1, 1973, 2327983
Int. Cl.² C10B 5/12
U.S. Cl. 202—141 7 Claims



1. In a horizontal coke oven having vertical regenerators for heat exchange between combustion supporting gases and burnt gases, a sole flue communicating with said vertical regenerators for the supply and removal of gaseous media, and a stationary horizontal partition having ports therein for the conduction of the gaseous media between the sole flue and various sections of said vertical regenerators which include fillings of checkerbricks having longitudinal and transverse walls that bound continuous passages of oblong cross section, the outer walls of said checkerbricks having projecting ribs engageable with the projections of the checkerbricks above and below, the improvement comprising a plurality of plates arranged end-to-end in a gaseous controlling relation below said stationary horizontal partition with adjacent ends of the plates being normally spaced from each other, each of said plates being associated with a different one of discrete various sections of the vertical regenerators, said plates having portal openings contiguous with the stationary ports of said horizontal partition, ribs depending from the lowermost checkerbrick in each section for engaging the top surface of said stationary horizontal partition, said plates being independently adjustable in the direction of the length of the sole flues for determining the extent to which said ports of the stationary horizontal partition are masked by said plates, and means extending downwardly from the underside of said plurality of plates for separate adjustable movement thereof.

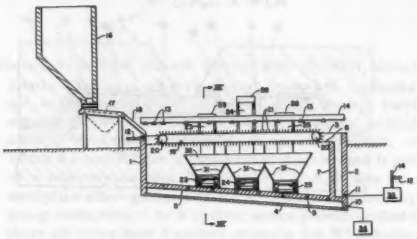
3,969,192
PROCESS AND APPARATUS FOR QUENCHING HOT COKE

Carl-Heinz Struck, Bochum-Dahlhausen, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Division of Ser. No. 260,766, June 8, 1972. This application Oct. 26, 1973, Ser. No. 409,812
Int. Cl.² C10B 39/12
U.S. Cl. 202—230 6 Claims

1. A coke quenching apparatus comprising a substantially rectangular water tank adapted to be filled with water to a predetermined level for the quenching of pieces of hot coke, hopper means receiving hot coke for quenching in said tank, means for separating fines from those pieces of hot coke which are to be quenched by the water in said tank, means for delivering the hot pieces of coke from said hopper means into

the water contained by said tank at a location which is adjacent one side wall of the tank, spray nozzles above the tank for spraying water on the hot coke as it enters the tank, means for supplying the main quantity of water at said one side wall of the tank, conveyor means above the water in the tank for moving pieces of coke floating in the water from a location which is adjacent said one side wall toward the opposite side wall of the tank, said conveyor means being constructed to advance the pieces of coke in the tank only while floating in



the water until each piece of coke becomes saturated due to absorption of a quantity of water in relation to the weight of the pieces of coke, and an endless conveyor belt means in the tank for receiving the pieces of coke which become saturated and sink onto it, said endless conveyor belt means being arranged to carry the pieces of coke which sink onto it in a direction transversely of the direction of movement of said conveyor means to discharge the saturated pieces of coke from said tank.

3,969,193

METHOD FOR PREVENTING SCALE IN SALINE WATER DESALTING APPARATUS AND SALINE WATER RECLAMATION APPARATUS FOR CARRYING OUT SAID METHOD

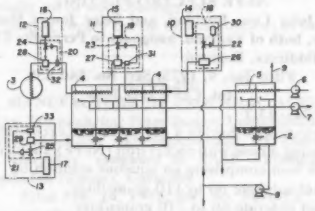
Junichi Sakuma, and Shigeo Takahashi, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1971, Ser. No. 104,392

Claims priority, application Japan, July 11, 1970, 45-60766

Int. Cl.² C23F *14/00*

U.S. Cl. 203—7 **5 Claims**



1. A method for preventing the formation of scale during the operation of a saline water desalting apparatus of the type in which saline water is passed through a system of condenser and heater passages having heating surfaces, said method comprising periodically charging said saline water with an acid at predetermined time intervals, and thereafter passing the charged saline water into said system of passages at a point intermediate the ends of the passages, whereby alkali scale formed upon said heating surfaces is periodically dissolved and removed at a stage at which very fine nuclei of scale are being formed.

3,969,194

METHOD AND APPARATUS FOR THE PURIFICATION OF A LIQUID CONTAMINATED WITH RADIOACTIVE SUBSTANCES

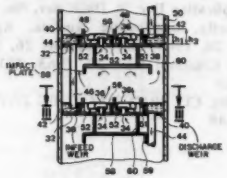
Hanns Mende, Bad Nauheim, Germany, assignor to Luwa AG, Zurich, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,806

Claims priority, application Switzerland, Oct. 30, 1973, 15242/73

Int. Cl.² B01D *3/00, 3/14, 1/26, 47/00*

U.S. Cl. 203—40 **7 Claims**



1. A method of purifying a liquid contaminated with radioactive substances, comprising the steps of: supplying the contaminated liquid into an evaporator with which there is connected a column having a multiplicity of superposed floors, generating vapors in the evaporator, providing a washing reflux liquid, substantially uniformly distributing the washing liquid at the floors, guiding the generated vapors through the washing liquid, said washing liquid flowing at each floor in substantially horizontal countercurrent direction with respect to the vapors, said washing liquid arriving at each floor from a region of lower radioactive concentration of the washing liquid from the superjacent floor and flowing to a region of higher radioactive concentration thereof in the subjacent lower floor, deflecting the washing liquid at each floor a number of times in such a manner that the washing liquid together with droplets entrained by and in the vapors are substantially uniformly admixed, impeding the flow of vapors in the vertical direction at each floor by confining the vapors above the liquid thereon to relatively close proximity with the liquid surface, controlling the flow of the vapors in horizontal direction along each floor so that at least a portion of the vapors flow towards the infeed region of lower radioactive concentration of the washing liquid on each floor, to thereby force at least a portion of the washing liquid and the droplets entrained by the vapors to move countercurrently in the direction of said region of lower radioactive concentration, the forced back droplets thus being intensively commingled with the washing liquid in order to increase the removal of the droplets entrained by the vapors into the washing liquid and to subject the washing liquid to an intensive substantially constant intake of the radioactive substances.

3,969,195

METHODS OF COATING AND SURFACE FINISHING ARTICLES MADE OF METALS AND THEIR ALLOYS

Richard Dötzer, and Klaus Stöger, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 249,279, May 1, 1972. This application Oct. 26, 1972, Ser. No. 300,906

Claims priority, application Germany, May 7, 1971, 2122610; Oct. 28, 1971, 2153831

Int. Cl.² C25D *1/00, 5/34, 5/44*

U.S. Cl. 204—14 N **11 Claims**

1. A process for electroplating a metal article comprising:

a. eroding the surface of said article with finely-divided abrasive particles suspended in an anhydrous aprotic liquid; and

b. electroplating said article in an aprotic organo metal electroplating electrolyte free of water and molecular oxygen.

3,969,196

PROCESS FOR THE SEPARATION OF MIXTURES OF SUBSTANCES

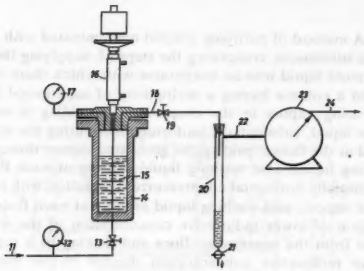
Kurt Zosel, Oberhausen-Rhineland, Germany, assignor to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Continuation of Ser. No. 359,o80, April 14, 1964, abandoned. This application Dec. 9, 1969, Ser. No. 880,475

Claims priority, application Austria, Apr. 16, 1963, 3085/63; July 26, 1963, 6005/63; July 26, 1963, 6006/63; Aug. 7, 1963, 6366/63; Nov. 20, 1963, 9310/63; Dec. 18, 1963, 10203/63

Int. Cl.² B01D 3/24; C10G 21/14

U.S. Cl. 203—49 24 Claims



1. The process of separating a mixture which is in liquid state or solid state or liquid and solid state composed of a plurality of compounds at least one of which contains an organic group which comprises:

a. contacting said mixture with a gas phase preferentially taking up said compound containing an organic group at the contacting conditions, said gas phase during said contacting being maintained under supercritical conditions of temperature and pressure such that the gas takes up at least a portion of said compound containing an organic group, the temperature being in a range in which the quantity of said compound containing an organic group taken up by said gas phase varies inversely with said temperature, and effecting said contacting in a manner so that this occurs, and so that there is a substantial gas component that is identifiable as a gaseous component, the critical temperature of said gas phase being in the range of 0°–200°C, the temperature of said gas phase during said contacting being within about 100°C above the critical temperature,

b. separating the gas phase in the form of said identifiable gaseous component loaded with said portion of the compound containing an organic group taken up during said contacting from any of the mixture not taken up by the gas phase while still maintaining supercritical conditions as aforesaid,

c. thereafter separating at least part of the compound containing an organic group taken up, from the gas phase.

3,969,197

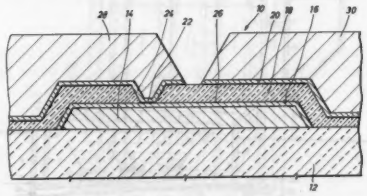
METHOD FOR FABRICATING A THIN FILM CAPACITOR

Neal Jay Tolar; Robert Curlee Hooper, both of Plano; Prabhakar Bhimrao Ghate, Dallas, and Clyde Rhea Fuller, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 8, 1974, Ser. No. 440,878

Int. Cl.² C25D 5/02, 5/12

U.S. Cl. 204—15 19 Claims



1. A method of fabricating a thin film capacitor for use as a component of a thin film circuit or for use in beam lead assembly as part of a hybrid circuit, said method comprising the steps of:

a. providing a capacitor substrate;

b. depositing on said substrate a thin film counter electrode;

c. patterning said thin film counter electrode;

d. depositing a first thin metallic film over said patterned counter electrode;

e. patterning said first thin metallic film;

f. depositing a dielectric film over said patterned metallic film;

g. selectively removing a portion of the dielectric film to provide a path for electrical contact to the bottom electrode; and

h. depositing a second thin metallic film over the dielectric film thereby establishing contact to the bottom electrode, the coefficient of expansion of said thin metallic films and said dielectric film being sufficiently close to prevent overstressing of said dielectric film as said capacitor is heated and cooled, and patterning said second thin metallic film to provide first and second terminals for said capacitor.

3,969,198

NI-FE ELECTRO-PLATING

Malcolm John Law, Dorking, and Peter James Hutchinson, Langley, both of England, assignors to Permalite Chemicals Ltd., Middlesex, England

Filed Jan. 9, 1975, Ser. No. 540,036

Int. Cl.² C25D 3/56

U.S. Cl. 204—43 T 3 Claims

1. An electrolyte having a pH value not exceeding 3.8 for electroplating a base with nickel iron (Ni-Fe) alloy containing 22 to 30% iron comprising an aqueous solution of:

A. nickel sulphate 60 to 110 grams/liter;

B. nickel chloride 60 to 110 grams/liter;

C. boric acid 30 to 45 grams/liter;

D. 8 to 16 grams/liter of a ferrous salt;

E. 10 to 30 grams/liter of an alkali metal fluoborate;

F. an amount effective to yield a bright nickel-iron coating of at least one compound selected from the group consisting of

1. unsaturated aliphatic sulphonic acids, and the alkali metal, ammonium, magnesium, and nickel salts thereof;

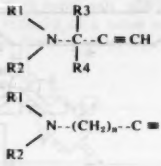
2. mononuclear aromatic sulphonic acids and the alkali metal, ammonium, magnesium and nickel salts thereof;

3. monuclear aromatic sulphonamides and sulphonimides;

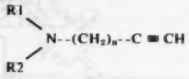
4. binuclear aromatic sulphonic acids and alkali metal, ammonium, magnesium and nickel salts thereof; and

5. heterocyclic sulphonic acids and alkali metal, ammonium, magnesium and nickel salts thereof;

G. 0.001 to 0.2 grams/liter of a hydrochloride of an amino compound having either of the following formulae:



(1)



(2)

wherein R1 is alkyl, alkenyl, alkynyl, hydroxy alkyl, alkoxy, alkoxy alkyl, aryl, aralkyl, alkaryl, cycoalkyl, cycloalkenyl, or heterocyclic; R2 is methyl, ethyl, propyl, butyl, alkenyl, alkynyl, hydroxyalkyl, alkoxy, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl or heterocyclic; or where R1 and R2 are joined so that the nitrogen is part of a heterocyclic ring structure; R3 is hydrogen or a methyl or ethyl group, and R4 is hydrogen or an alkyl group containing 1 to 6 carbon atoms providing that if there are more than 2 carbon atoms in R4, R3 is hydrogen; and n is 1, 2 or 3; and

H. a minor proportion effective to prevent oxidation of the ferrous ion to the ferric state of a compound selected from the group consisting of sodium bisulphite, sodium benzene sulphinate and sodium para-toluene sulphinate.

3,969,199
COATING ALUMINUM WITH A STRIPPABLE COPPER DEPOSIT

Betty L. Berdan, and Betty M. Luce, both of Willowick, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed July 7, 1975, Ser. No. 593,894
Int. Cl.² C25D *5/44, 1/00*
U.S. Cl. 204—33 **13 Claims**

1. A method of electroplating an aluminum carrier with a mechanically strippable copper electroplate, which method comprises providing said carrier with a coating by contacting said carrier with an aqueous, alkaline solution of alkali metal zincate containing at least about 0.25 g/l of a water soluble salt of a metal selected from the group consisting of iron, cobalt, nickel and mixtures thereof, and a complexing agent for the metal ions introduced as said water soluble salt,

contacting said coated carrier with an acid to remove substantially all of said coating, and

electroplating copper on the treated surfaces of said carrier.

3,969,200
MANUFACTURE OF PROPIOLIC ACID

Heinz Nohe, Meckenheim; Peter Jaeger, Ludwigshafen, both of Germany, and BASF Aktiengesellschaft, 03, Ludwigshafen, Rhine, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 14, 1975, Ser. No. 549,912

Claims priority, application Germany, Feb. 26, 1974, 2409117

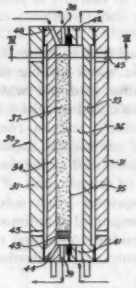
Int. Cl.² C25B *3/02, 11/10, 11/16*
U.S. Cl. 204—79 **7 Claims**

1. A process for the manufacture of propiolic acid by anodic oxidation of propargyl alcohol in aqueous sulfuric acid solution at a temperature not exceeding 40°C, wherein one or more lead dioxide/titanium composite electrodes are used as anodes and the propiolic acid is extracted from the aqueous sulfuric acid electrolyte with a straight-chain aliphatic ether which contains three oxygen atoms and boils above propiolic acid.

3,969,201
ELECTROLYTIC PRODUCTION OF ALKALINE PEROXIDE SOLUTIONS

Colin William Oloman, and Alan Paul Watkinson, both of Vancouver, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 13, 1975, Ser. No. 540,533
Int. Cl.² C25B *1/30*
U.S. Cl. 204—83 **16 Claims**

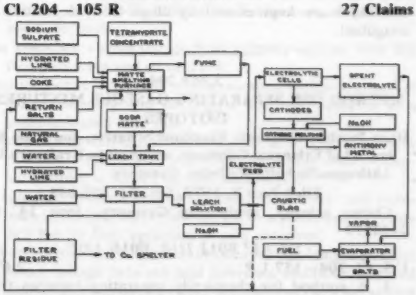


1. A process for producing an alkaline peroxidecontaining solution by the electrolysis of an alkaline electrolyte in an electrolytic cell, which comprises passing an aqueous alkaline electrolyte and oxygen simultaneously in a direction normal to the electric current, through a fluid permeable conductive mass forming a cathode bed in said cell, said bed being separated from the anode by a barrier wall, whereby alkaline peroxide is generated in the solution within the cathode bed by reaction between the aqueous alkaline electrolyte and oxygen on the surfaces of the fluid permeable conductive mass forming the cathode bed.

3,969,202
PROCESS FOR THE RECOVERY OF ANTIMONY VALUES FROM ORES CONTAINING SULFO-ANTIMONY COMPOUNDS OF COPPER, AND ARSENIC

Adrian E. Albrethsen, Somerville; Max L. Hollander, Plainfield, both of N.J., and William H. Wetherill, Staten Island, N.Y., assignors to Asarco Incorporated, New York, N.Y.

Filed June 2, 1975, Ser. No. 582,954
Int. Cl.² C25C *1/22*
U.S. Cl. 204—105 R **27 Claims**



1. A process for recovery of antimony values from a material containing a sulfo-antimony compound of copper and arsenic which comprises:

a. smelting a charge comprising the material containing the sulfo-antimony compound of copper and arsenic, sodium sulfide, calcium values supplied as lime and/or limestone,

and a reducing agent for a period sufficient to convert at least a major portion of the antimony to a water-soluble sodium compound of antimony and sulfur and convert at least a major portion of the arsenic to at least one water-insoluble calcium compound of arsenic and oxygen;

b. the sodium sulfide being incorporated in the charge for the smelting in an amount sufficient to convert at least a major portion of the antimony to the water-soluble sodium compound of antimony and sulfur, and the calcium values being incorporated into the smelting charge in an amount sufficient to convert at least a major portion of the arsenic to the water-insoluble calcium compound of arsenic and oxygen;

c. leaching an alkaline matte obtained from the smelting of (a) containing the water-soluble sodium compound of antimony and sulfur and the water-insoluble calcium compound of arsenic and oxygen with an aqueous liquid to dissolve the soluble sodium compound of antimony and sulfur to the substantial exclusion of the calcium compound of arsenic and oxygen and a water-insoluble sulfur compound of copper; and

d. separating an aqueous leach solution containing the soluble sodium compound of antimony and sulfur from an insoluble leach residue containing the insoluble calcium compound of arsenic and the insoluble sulfur compound of copper.

3,969,203

WASTE WATER TREATMENT

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Feb. 19, 1974, Ser. No. 443,613

Int. Cl.[2] C25F *1/00*; C25B *1/04*

U.S. Cl. 204—149 **11 Claims**

1. A method of treating industrial waste water containing about 0.1% to about 5% by volume of oily material for the removal of organic and oily material therein which comprises exposing said waste water to impressed current by means of a plurality of spaced apart ferrosilicon alloy electrodes, said waste water containing about 10 to about 10,000 ppm of coagulant, some of which would normally deposit on the cathode, impressing direct current with a constant voltage of between about 10 to about 20 volts on a circuit including said electrodes thereby causing microbubbles to be formed in an amount in excess of 10^5 microbubbles per liter and having an average size of about 200 microns or less which carry the oily material to the surface, and periodically reversing the current in said circuit often enough so that the size of the microbubbles does not exceed about 200 microns and whereby the electrodes are kept essentially clean from deposition of a coagulant.

3,969,204

METHOD FOR SEPARATING GASEOUS MIXTURES OF ISOTOPES

Hans-Joachim Neimann; Eberhard Schuster, and Arno Kersting, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

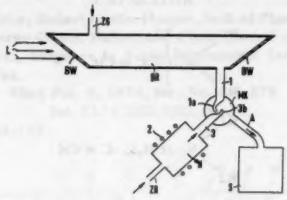
Filed June 9, 1975, Ser. No. 585,058

Claims priority, application Germany, June 14, 1974, 2428577

Int. Cl.[2] B01J *1/10*; B01K *1/00*

U.S. Cl. 204—157.1 R **2 Claims**

1. A method for chemically separating isotopes from a mixture of gaseous matter formed by mixed isotopes, by a chemical reaction partner, by a reaction directed by a light beam projected through the mixture with the light beam having a narrow band of wave lengths molecularly exciting mainly the isotope to be separated and thereby promoting its reaction with the reaction partner, and molecularly exciting the reaction partner with addition energy to a degree substantially reducing the energy of the laser beam required to promote said reaction in the absence of the addition of the energy to the reaction partner; wherein the improvement comprises maintaining said mixed isotopes and said partner physically



separated from each other during the exciting of each, and prior to loss of their excited states mixing them together to cause said reaction.

3,969,205

PROCESS FOR PRODUCING 2-CHLOROPYRIDINE

Masao Kawamura, Akashi; Tadaaki Nishi, Kakogawa, and Syuzi Takagi, Akashi, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

Filed Dec. 6, 1974, Ser. No. 530,563

Claims priority, application Japan, Dec. 8, 1973, 48-139851

Int. Cl.[2] B01J *1/10*

U.S. Cl. 204—158 HA **15 Claims**

1. A process for producing 2-chloropyridine by reaction of pyridine with chlorine in a molar ratio of pyridine to chlorine of 0.5 – 10 : 1 under irradiation of photolytic light of 2,000 to 5,000 A using at least 0.5 moles of halogenated hydrocarbon as a diluent per one mole of pyridine, an improvement comprising carrying out the reaction in the presence of at least 0.2 moles of water per mole of pyridine.

3,969,206

PROCESS FOR STABILIZATION OF ULTRAVIOLET LIGHT CURABLE UNSATURATED POLYESTER RESIN MIXTURE

Lodewijk Roskott, Gorssel, and Arnoldus Adrianus Maria Groenendaal, Vorden, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed June 18, 1973, Ser. No. 370,671

Claims priority, application Netherlands, June 20, 1972, 7208381

Int. Cl.[2] C08G *63/02*; C08K *67/06*, *5/04*; C08F *8/00*

U.S. Cl. 204—159.15 **26 Claims**

1. A process for stabilizing a composition curable by ultraviolet light consisting essentially of an unsaturated polyester resin which is a mixture of an unsaturated polyester resin obtained by condensation of a polyhydric alcohol and and α, β unsaturated dibasic carboxylic acid and at least one polymerizable ethylenically unsaturated monomer and as photosensitizer a benzoin compound comprising

incorporating into said composition a stabilizing amount of methyl p-benzoquinone.

3,969,207

METHOD FOR THE CYCLIC ELECTROCHEMICAL PROCESSING OF SULFURIC ACID-CONTAINING PICKLE WASTE LIQUORS

József Kerti; Andor Mándoki, both of Budapest, and Miklós Széky, Salgotarjan, all of Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

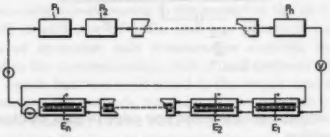
Filed Mar. 5, 1975, Ser. No. 555,430

Int. Cl.[2] C25F *7/02*

U.S. Cl. 204—180 P **4 Claims**

1. A process for the cyclic electrochemical processing of pickle waste liquors containing a maximum of 100 g. of sulfuric acid and a minimum of 25 g. of iron ions per liter, by the

electrochemical decomposition of iron sulfate and the electrodialytic separation of the acid and sulfate salt components of the pickle waste liquor, in which the ammonium, magnesium or alkali metal sulfate concentration of the waste liquor is adjusted to 0.5 to 1.0 mol./l. by introducing an ammonium, magnesium or alkali-metal salt, and the acid content of the waste liquor is reduced to a value not exceeding 100 g. of sulfuric acid/liter, then the waste liquor is fed into and passed



as catholyte through the cathode chambers of a series of dual electrolytic cells with diaphragms, whereupon the iron content of the waste liquor is reduced to a value of 7 to 15 g. of Fe^{2+}/liter, thereafter the waste liquor is fed into and passed as anolyte through the anode chambers of said electrolytic cells in parallel with the cathode flow, and a current density of 15 to 22 A/dm². of diaphragm surface and an electrolysis temperature of 70 to 90°C is maintained in said cells.

3,969,208

ULTRASONIC APPARATUS

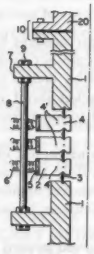
Setsuya Isshiki; Tetsuo Shiromizu; Hiroto Oshima, all of Tokyo; Kozo Okada, Nagoya; Kiyoshi Kazunaga, and Eiji Mori, both of Tokyo, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo; NGK Spark Plug Co., Ltd., Nagoya and Seidensha Electronics Co., Ltd., Tokyo, all of, Japan

Filed Apr. 8, 1974, Ser. No. 458,971

Claims priority, application Japan, Apr. 13, 1973, 48-041428; Apr. 13, 1973, 48-041429

Int. Cl.² B01J *1/12*

U.S. Cl. 204—193 **15 Claims**



1. An ultrasonic apparatus of substantially tubular form for transmitting ultrasonic waves to a fluid contained therein, comprising:

a container of tubular form including a pair of axially spaced annular wall segments;

at least one ring-shaped metallic resonator, spaced coaxially between said container segments, and means including an ultrasonic wave transducing element on the radially outer edge of each said resonator for oscillating ultrasonic waves to the interior of said container radially through said resonator;

a ring-shaped metal ultrasonic wave transfer preventive member at each end of said resonator, each said preventive member having an axially pointed cross section end pressed in tight line contact against the opposed end of said resonator at a nodal portion of the ultrasonic waves transferred by said resonator, and means pressing at least one said ring-shaped resonator and a pair of said preventative members contacting opposite ends of said resonator in an axially extending stack between the ends of said spaced container segments for continuing the central opening of said tubular container therethrough;

whereby said preventative members limit loss of ultrasonic energy to said container segments and act as seals to prevent radial outward loss of a fluid medium from said container.

3,969,209

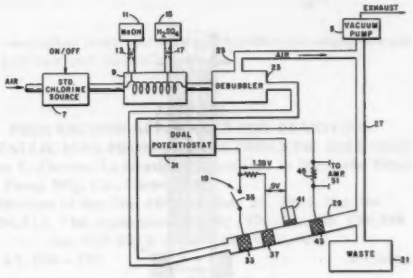
AUTOMATIC ELECTROCHEMICAL AMBIENT AIR MONITOR FOR CHLORIDE AND CHLORINE

Theodore R. Mueller, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1975, Ser. No. 594,164

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **6 Claims**



1. A system for electrochemical monitoring of the chlorine and/or chloride level in atmospheric air mixed with a flowing electrolyte, comprising:

a flow-through electrochemical cell disposed to receive said flowing electrolyte including a conditioning electrode disposed in said cell for contacting said flowing electrolyte entering said cell, an analytical electrode disposed to contact said flowing electrolyte downstream of said conditioning electrode, a reference electrode disposed to contact said flowing electrolyte downstream of said analytical electrode, and a counter electrode disposed to contact said flowing electrolyte downstream of said reference electrode;

an absorber connected in fluid communication with the flow-receiving end of said cell;

means connected in fluid communication with said absorber for introducing said electrolyte into said absorber at a predetermined flow rate;

means for selectively introducing air at a controlled flow rate into said absorber wherein the chlorine and/or chloride content is sorbed by said electrolyte;

a standard chlorine source disposed to generate and introduce upon command chlorine gas at a predetermined rate into the air flow upstream of said absorber;

means connected to said electrodes for applying a positive direct voltage between said reference electrode and said analytical electrode to effect reduction of chlorine sorbed in said electrolyte flowing through said cell and selectively applying upon command a greater positive voltage between said reference electrode and said conditioning electrode to provide oxidation of chloride sorbed in said electrolyte flowing through said cell which is subsequently reduced to chlorine at said analytical electrode; and

process control means responsive to a repeating programmed schedule for controlling the introduction of

chlorine gas from said standard chlorine source selectively actuating said conditioning electrode and sensing the reduction currents flowing through said counter electrode indicative of the chlorine concentration in said cell for different periods when said chlorine source is "on" and "off" and said conditioning electrode is activated or inactivated to separately determine and indicate the chlorine and/or chloride level content in the air introduced into said system.

3,969,210

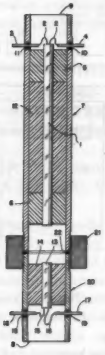
APPARATUS FOR WATER DETERMINATION

Gustav Bergson, Cedarbrook Hill Apts. 11 Apt. B-117, Wyncote, Pa. 19095

Filed Apr. 21, 1975, Ser. No. 569,868

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 W **8 Claims**



1. An electrolytic cell comprising a first hollow element adapted to pass sample fluid and containing electrodes bridged by a hygroscopic material and a second, separate, hollow element adapted to pass sample fluid and containing electrodes bridged by a hygroscopic material in series of a further point from the standpoint of the passage of the fluid with the first element, the length of the first element being at most one-third of the length of the second element.

3,969,211

CONTINUOUS APPARATUS FOR ELECTROLYTIC TREATMENT ON A LONG STRUCTURE OF ALUMINUM OR ITS ALLOYS

Hiroshi Watanabe; Isao Shimamura, both of Hiratsuka; Norio Murohushi, Yamakita; Masao Abe, Yokohama; Yoshio Ando, and Masaaki Takahashi, both of Tokyo, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

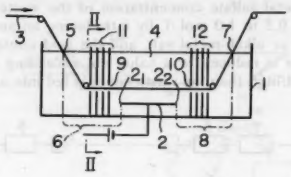
Filed June 3, 1975, Ser. No. 583,393

Claims priority, application Japan, June 8, 1974, 49-65330

Int. Cl.² C25D *11/02, 11/04*

U.S. Cl. 204—211 **13 Claims**

1. In an apparatus for continuous electrolytical treatment of a long structure of aluminum or an alloy thereof including an electrolytic cell, an electrolytic treating solution contained therein, and an electrode, said electrode and said structure constituting an electric circuit and supplied with an electric potential, the improvement which further comprises electric field buffer means having a through opening therein for passage of said structure therethrough and being disposed at least in one zone between a position where said structure is introduced into the solution and one edge of said electrode facing said position.



3,969,212

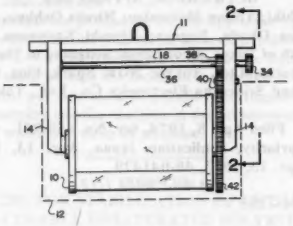
REINFORCED HANGER BRACKET FOR ELECTROPLATING BARREL AND METHOD OF REINFORCING A PLASTIC BAR

Albert Singleton, Middleburg Heights, and Carel H. Neffenger, Elyria, both of Ohio, assignors to The Albert Singleton Corporation, Cleveland, Ohio

Filed Apr. 3, 1975, Ser. No. 564,809

Int. Cl.² C25D *17/06, 17/20;* B29D *3/00;* B01F *9/00*

U.S. Cl. 204—213 **17 Claims**



1. An improved hanger bracket for supporting a rotatable barrel within a fluid treatment tank wherein the bracket is connected to the barrel by means for allowing the barrel to rotate relative to the bracket about an axis passing through the bracket and to a barrel support frame which in turn may be supported on the tank,

said bracket being constructed of a resin material having encased therein, in fluid tight arrangement, a metal strip to strengthen the bracket against bending, said strip having a width W, a thickness T, and a length L, the improvement comprising,

said bracket being curved inward from its connection with the frame toward its connection with the barrel to compensate for changes in barrel length due to thermal expansion and contraction of the barrel.

3,969,213

ALUMINUM ELECTROLYTIC CELLS

Shoji Yamamoto; Masahiko Eki, and Kimihiko Kato, all of Tomakomai, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Oct. 25, 1974, Ser. No. 517,968

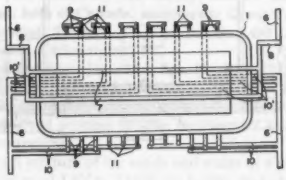
Claims priority, application Japan, Oct. 26, 1973, 48-119977

Int. Cl.² C25C *3/06, 3/16*

U.S. Cl. 204—244 **5 Claims**

1. In a potline having a plurality of electrolytic cells for the reduction of aluminum, each cell having a rectangular potshell adapted to be arranged with other similar potshells in serially electrically connected side by side relationship to make a row

of electrolytic cells wherein the lengthwise axis of each potshell is arranged generally perpendicularly to the row of cells, each potshell having an electrically conductive cathode potlining and a plurality of cathode collector elements extending generally normal to the lengthwise potshell axis in electrical engagement with said potlining with their ends projecting exteriorly of said potshell, and a current carrying bus structure disposed exteriorly of said potshell for carrying current from its cathode collector elements to the anode of the next downstream cell in said row of cells, said bus structure including pluralities of upstream and downstream cathode bus bars connected to the corresponding ends of said cathode collector elements, anode bus bars connected to the anode, and line bus bars connecting the cathode bus bars of one potshell in series to the anode bus bars of the next potshell, the improvement wherein said line bus bars at their cathode ends at least in the vicinity of each potshell extend along the opposite ends of the potshell outside its confines to connect with the ends of two



opposed groups of upstream cathode bus bars, the bus bars in said groups including

a. transverse sections extending perpendicularly of the lengthwise potshell axis spaced intervals along said axis, each such transverse section being connected to the upstream end of at least one cathode collector bar, and

b. longitudinal sections stretching outwardly to the potshell ends in opposite directions beneath the potshell generally parallel to the lengthwise potshell axis, with the longitudinal sections in each group having their inward ends terminating at spaced apart points beneath said potshell connecting with the corresponding transverse sections,

and said downstream cathode bus bars extend in oppositely directed groups generally parallel to the lengthwise potshell axis adjacent to and exteriorly of the downstream side of said potshell, each such downstream cathode bus bar being connected between one of said line bus bars and the downstream ends of a group of said cathode collector bars.

3,969,214

PERMANENT MAGNET HYDROGEN OXYGEN GENERATING CELLS

Mack Harris, 3005 Cumberland, Little Rock, Ark. 72206

Filed May 31, 1973, Ser. No. 359,550

Int. Cl.[2] C25B *1/02, 1/04, 1/10, 9/00*

U.S. Cl. 204—275 **13 Claims**

1. A gas generating device comprising:

a. a cell;

b. first and second electrodes disposed within said cell, said electrodes being electrically connected;

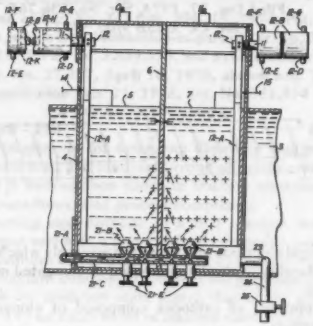
c. means for producing magnetic flux within said cell, said flux acting substantially along a single direction;

d. a mixing chamber having a first input port for feeding sulfuric acid thereto and a second input port for feeding water thereto;

e. said mixing chamber having an interior portion for receiving said sulfuric acid and water from said first and second ports respectively;

f. said mixing chamber having an outlet port in communication with said cell for releasing the resultant mixture into said cell, and

g. said mixing chamber being oriented for releasing said resultant mixture in a direction substantially perpendicular to the direction of said magnetic flux whereby the ions



emanating from said mixing chamber are urged toward said first and second electrodes.

3,969,215

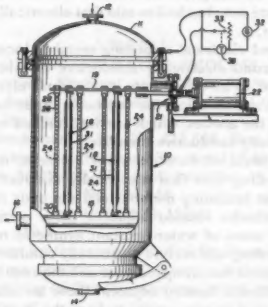
PROCESS AND APPARATUS FOR REMOVING METALLIC IONS FROM AN ELECTROLYTIC SOLUTION

James F. Zievers, La Grange, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Division of Ser. No. 445,544, Feb. 25, 1974, Pat. No. 3,896,013. This application Jan. 8, 1975, Ser. No. 539,399

Int. Cl.[2] B01K *1/00;* **C25B** *9/00, 9/02*

U.S. Cl. 204—276 **4 Claims**



1. Liquid treating apparatus for removing metal ions from a liquid solution, comprising

tank means having a pressure chamber therein,

a first member having a cavity therein and mounted in said chamber,

said first member having a foraminous outer surface separating said cavity from said chamber,

a porous cake of carbon particles deposited on the outside of said foraminous surface,

a second member mounted in said chamber in spaced relationship with said cake,

means for maintaining a potential difference between said members to establish an electric field through said cake,

a liquid inlet through which said liquid solution is supplied to said chamber, and

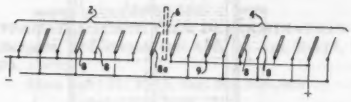
a liquid outlet connected to said cavity for carrying the treated liquid from said tank,

whereby as said liquid passes through said cake into said cavity metal ions are deposited on the interior surfaces of said cake.

3,969,216
FLOTATION SEPARATION

Doreen Veronica Barrett, Hill View, Davenport Road, Heswall, Merseyside, England

Filed Dec. 27, 1974, Ser. No. 536,765
Int. Cl.² C25B 9/00, 9/02
U.S. Cl. 204—286 12 Claims



1. A rigid electrode grid structure assembly which includes:
a. a plurality of anodes composed of elongated metal members,
b. a plurality of cathodes composed of elongated metal members,
c. said anodes being alternately arranged in a spaced apart substantially parallel relationship with one another,
d. a first electrically conductive member and a second electrically conductive member, said members being disposed in a spaced apart parallel relationship with each other, both members being disposed transversely with respect to said anodes and cathodes,
e. means for joining at least some of said anodes to said first electrically conductive member,
f. means for joining at least some of said cathodes to said second electrically conductive member,
g. a first electrical insulating member located adjacent said first electrically conductive member and being disposed so as to separate said first electrically conductive member and the anodes joined to it from the ends of the cathodes, which are not attached to said first electrically conductive member,
h. a second electrical insulating member located adjacent said second electrically conductive member and being disposed so as to separate said second electrically conductive member and the cathodes joined to it from the ends of the anodes, which are not attached to said second electrically conductive member,
i. a first mass of water-resistant synthetic resin material surrounding said first electrically conductive member, said first insulating member and the ends of the anodes and cathodes located adjacent these members, and a second mass of water-resistant synthetic resin material surrounding said second electrically conductive member, said second insulating member and the ends of the anodes and cathodes located adjacent these members, said first and second masses serving to form the entire assembly of cathodes, anodes, conductive members and insulating members into a rigid electrode grid structure, and
j. means to supply electrical power to said first and second electrically conducting members.

3,969,217
ELECTROLYTIC ANODE

Tilak V. Bommaraju, and Donald E. Stephens, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

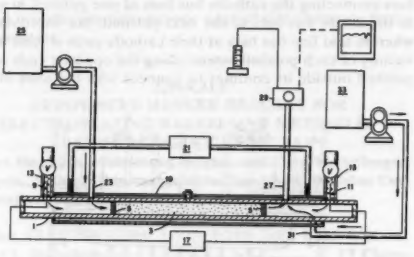
Filed Oct. 7, 1974, Ser. No. 513,009
Int. Cl.² C25B 11/06, 1/34, 10/10
U.S. Cl. 204—290 F 11 Claims

1. An electrode which comprises an electrically conductive substrate having adhered thereto and extending over at least a portion of the surface thereof, a coating of mixed oxides comprising about 10 to about 80 mole percent indium oxide, and about 10 to about 90 mole percent of a platinum group metal oxide.

3,969,218
ELUTION ELECTROPHORESIS

Charles D. Scott, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 11, 1975, Ser. No. 548,941
Int. Cl.² G01N 27/26, 27/28
U.S. Cl. 204—299 R 3 Claims



1. An apparatus for separating macromolecules, comprising:
a column packed with a particulate anticonvective medium;
sample introduction means communicating with a central portion of said column;
electrode means for applying an emf across the length of said column and positioned adjacent the extremities of said column;
eluent introduction means at one end of said column;
eluate extraction means at the other end of said column;
flow balancing means positioned downstream from said eluate extraction means for preventing samples from flowing past said eluate extraction means;
an eluent source communicating with said balancing means; and means for detecting separated molecules communicating with said extraction means.

3,969,219
ZINC OR CADMIUM ELECTROPLATING BRIGHTENER COMPOSITIONS AND PROCESS

John C. Kosmos, Hasbrouck Heights, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,247
Int. Cl.² C25D 3/24, 3/28
U.S. Cl. 204—50 Y 12 Claims

1. In a process for bright plating of zinc or cadmium from aqueous alkaline cyanide electroplating baths, the improvement which comprises adding to said baths an aqueous composition containing, in parts by weight:

Sodium lignin sulfonate	1.1–4.8
Veratraldehyde	1.0
Vanillin	0.1–2.5
Corn syrup or glucose	1.7–5.0
Niacinamide	0.007–0.14

and a molar equivalent amount of sodium bisulfite equal to the total molar equivalent amount of the vanillin and veratraldehyde.

7. An electroplating brightener composition for addition to zinc or cadmium alkaline cyanide electroplating baths comprising an aqueous solution containing, in parts by weight:

Sodium lignin sulfonate	1.1–4.8
Veratraldehyde	1.0
Vanillin	0.1–2.5
Corn syrup or glucose	1.7–5.0
Niacinamide	0.007–0.14

and a molar equivalent amount of sodium bisulfite equal to the total molar equivalent amount of the vanillin and veratraldehyde.

3,969,220

AERATING TAR SANDS-WATER MIXTURE PRIOR TO SETTLING IN A GRAVITY SETTLING ZONE

Joseph C. Anderson, Fort McMurray, and H. James Davitt, Edmonton, both of Canada, assignors to Great Canadian Oil Sands Limited, Toronto, Canada and Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 16, 1974, Ser. No. 506,371
Int. Cl.² C10G *1/04*
U.S. Cl. 208—11 LE **1 Claim**

1. An improved process for the recovery of bitumen from tar sands comprising:

a. forming a mixture of tar sands and water at a temperature in the range of 130° to 210°F. including that of the hereinafter specified recycle stream of aerated bitumen-rich middlings material; said mixture containing 0.2 to 3.0 pounds of water per pound of tar sands;

b. settling the mixture in a separation zone to form an upper bitumen froth layer, a middlings layer containing water, silt, clay, and bitumen, and a sand tailings layer;

c. separately removing the bitumen froth layer and the sand tailings layer;

d. passing a stream of middlings layer into an air scavenger zone and therein aerating said stream to provide additional bitumen froth;

e. recovering the froth from the scavenger zone;

f. passing a second bitumen-rich middlings stream to an aeration zone and mixing air into the middlings stream in said aeration zone and

g. admixing the aerated bitumen-rich middlings from said aeration zone with the mixture of step (a).

3,969,221

IRIDIUM-CONTAINING CATALYSTS

Howard Lee Mitchell, III, and James Richard Hays, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 4, 1974, Ser. No. 430,775
Int. Cl.² C10G *35/08*; B01J *27/02*
U.S. Cl. 208—139 **27 Claims**

1. A catalyst suitable for conversion of hydrocarbons comprising a composite of a porous inorganic oxide support, platinum in concentration ranging from about 0.05 to about 3 percent, iridium in concentration ranging from about 0.05 to about 3 percent, silver in concentration ranging from about 0.005 to about 5 percent, and sulfur in concentration ranging from about 0.001 to about 2 percent, based on the total weight of the catalyst, the atom ratio of the platinum:iridium ranging from about 0.25:1 to about 5:1, and the atom ratio of iridium:silver ranging from about 10:1 to about 1:12.

3,969,222

HYDROGENATION AND HYDRODESULFURIZATION OF HYDROCARBON DISTILLATE WITH A CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 443,046, Feb. 15, 1974, Pat. No. 3,900,386, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, and a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 21, 1975, Ser. No. 551,954
Int. Cl.² C10G *23/04*
U.S. Cl. 208—210 **4 Claims**

1. A hydroprocess for saturating diolefinic and monoolefinic hydrocarbons and for desulfurizing sulfurous compounds present in a hydrocarbon distillate fraction containing aromatic hydrocarbons, said process comprising:

a. contacting said distillate in a first reaction zone with hydrogen and with a first catalytic composite comprising (1) platinum or palladium metal, (2) iridium metal, (3) a germanium component wherein the germanium is present in an oxidation state above that of the elemental metal, (4) an alkali metal or alkaline earth metal, and (5) porous alumina carrier, said contacting being carried out to selectively hydrogenate said diolefinic hydrocarbons to monoolefinic hydrocarbons;

b. passing the first stage effluent to a second reaction zone and contacting said effluent with a second catalytic composite comprising (1) platinum or palladium metal, (2) iridium metal, (3) a germanium component wherein the germanium is present in an oxidation state above that of the elemental metal and (4) alumina, said contacting being carried out to hydrogenate the monoolefinic hydrocarbons and to convert the sulfurous components into hydrogen sulfide and hydrocarbons, and

c. separating a desulfurized hydrocarbon distillate from said second reaction zone containing said aromatic hydrocarbons therein.

3,969,223

OLEFIN SEPARATION PROCESS

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 423,599, Dec. 10, 1973, abandoned, which is a division of Ser. No. 317,861, Dec. 22, 1972, Pat. No. 3,929,669. This application Dec. 11, 1974, Ser. No. 531,656
Int. Cl.² C10G *25/04*
U.S. Cl. 208—310 Z **6 Claims**

1. In a process for the separation of olefins from a hydrocarbon feed mixture comprising olefins from a hydrocarbon feed mixture comprising olefins and saturates, which process comprises the steps of:

a. contacting said feed mixture with a bed of zeolite adsorbent at adsorption conditions to effect the selective adsorption of said olefins by said adsorbent;

b. withdrawing from said bed of adsorbent a raffinate stream comprising less selectively adsorbed saturates;

c. contacting the adsorbent bed with a desorbent material at desorption conditions to effect desorption of said olefins from said adsorbent; and,

d. withdrawing a stream containing olefins and desorbent material from said bed of adsorbent; THE IMPROVEMENT WHICH COMPRISES employing a zeolite adsorbent prepared by the steps of:

i. contacting a precursor mass comprising an X structured zeolite, and an amorphous binder selected from the group consisting of silica, alumina, and silica-alumina, and having a Na_2O/Al_2O_3 ratio of less than about 0.7 with an aqueous sodium hydroxide solution at ion exchange conditions for 0.5 to 5 hours to increase the sodium cation content to a $Na_2O/Al\ 2O_3$ ratio of greater than about 0.7

and to remove from about 1 to about 15 wt. % of SiO_2 and Al_2O_3 from the precursor mass;

ii. washing said mass with water maintained at a pH within the range of 7 to 10 to remove therefrom excess sodium hydroxide; and,

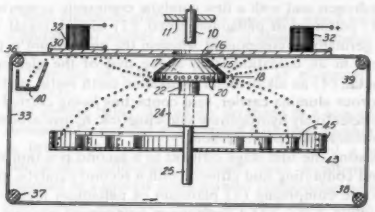
iii. at least partially dehydrating said meass at dehydrating conditions.

3,969,224

METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIAL

Thomas A. Cerbo, Carlstadt, N.J., assignor to Potters Industries Inc., Carlstadt, N.J.

Filed May 22, 1974, Ser. No. 472,503
Int. Cl.² B07B *13/10*
U.S. Cl. 209—12 7 Claims



1. A method for separating particles of different physical characteristics, comprising the steps of:

directing a supply of particles having different masses and magnetic characteristics into a rotary receptacle, the receptacle including an upstanding side wall which defines a series of apertures;

continuously rotating the receptacle at a speed sufficient to centrifugally project the particles through the apertures;

subjecting the projected particles to a magnetic field, the magnetic field drawing the particles having magnetic characteristics upwardly away from the remaining particles;

magnetically attracting the thus separated particles onto a continuously moving carrier to withdraw the separated particles from the vicinity of the receptacle;

the rotary receptacle projecting the remaining particles over different distances proportional to their masses; and

collecting successive mass gradations of said remaining particles.

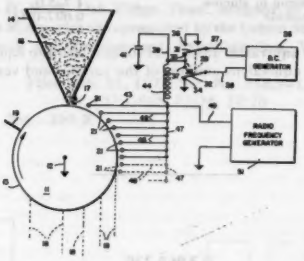
3,969,225

DIFFERENTIAL SEPARATION OF PARTICULATES BY COMBINED ELECTRO-STATIC AND RADIO FREQUENCY MEANS

Arnold S. Horowitz, Scarsdale, N.Y., assignor to I. Jordan Kunik, New York, N.Y., a part interest

Continuation-in-part of Ser. No. 457,981, April 4, 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,548
Int. Cl.² B03C *7/00*
U.S. Cl. 209—127 A 13 Claims

1. The method for selectively separating different homogeneous types of particulate materials from a random heterogeneous mixture of two or more of said homogeneous types of materials where the combination dielectric constant and loss factor of each homogeneous type of material is different from that of the other homogeneous types of material in said mixture, which comprises placing a mass of said heterogeneous materials in motion on a materials carrier and subjecting said moving mass both to an electrostatic charge and to a radio frequency electric field, said materials becoming electrostatically charged and differentially heated in said fields in accordance with their respective combination dielectric constants and loss factors, said materials losing their respective electrostatic charges differentially in different intervals of time pro-



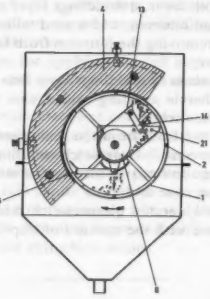
portional to their respective combined dielectric constants and loss factors and consequently falling off said carrier into separate successive receptacles.

3,969,226

HORIZONTAL DRUM-TYPE MAGNETIC SEPARATOR FOR GRANULAR FEEDS

Johann Moelders, Bergisch-Gladbach, Germany, assignor to Berger Maschinenfabriken G.m.b.H. & Co., Bergisch-Gladbach, Germany

Filed Mar. 28, 1974, Ser. No. 455,859
Claims priority, application Germany, Mar. 28, 1973, 2315451
Int. Cl.² B03C *1/14*
U.S. Cl. 209—39 10 Claims



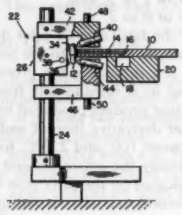
1. A drum-type magnetic separator for granular feeds of magnetic and nonmagnetic materials comprising: a rotatable drum having an axis of rotation, means for feeding the granular feeds into said drum, means for regulating infeed of the granular feed inside and throughout the length of said drum, means to adjust the position of said regulating means with respect to the inner surface of said drum, means for thrusting the granular feed of magnetic and nonmagnetic material thru said drum means for creating a magnetic field disposed about a portion of the outer periphery of said drum, a first chute located substantially above said axis of rotation and below said means for creating a magnetic field for collecting any nonmagnetic material carried with the magnetic material above said axis of rotation, a second chute extending substantially radially of said axis of rotation and having an opening above said axis of rotation and behind said first chute for collecting the magnetic material after the granular feed passes through the magnetic field, and means for adjusting said first chute with respect to said second chute and the inner surface of said drum.

3,969,227

PHOTOELECTRIC INSPECTION OF TRANSPARENT OR TRANSLUCENT MEDICINAL CAPSULES

Charles R. Garris, Stratford, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Nov. 1, 1974, Ser. No. 519,838
Int. Cl.² B07C 5/10
U.S. Cl. 209—73 3 Claims



1. In a medicinal capsule filling machine wherein a plurality of capsules are filled with a flowable solid medicament,

a rotatable disc for transporting elongated capsules temporarily secured to its periphery.

means for temporarily securing capsules to the periphery of said disc in an orientation such that the long axes of the capsules are substantially parallel to the axis of rotation of the disc,

inspection means comprising a light source and photoelectric detecting means both arranged adjacent to the periphery of said disc, and related to each other and to said disc so that light passes from the source to the detecting means in a straight line which is oblique with respect to the long axes of the capsules, which intersects the path of travel of the capsules, and which, if extended, will not pass through said disc, said light source and photoelectric detecting means being arranged so that the light passing from the source toward the detecting means is directed through a passing capsule near one of its ends, and

said inspection means including a second photoelectric detecting means arranged adjacent the periphery of the disc and related to the light source so that light passes from the light source to the second detecting means in a straight line which is oblique to the long axes of the capsules and which intersects the path of travel of the capsules, and is directed through said passing capsule near the other of its ends in a direction such that said straight line, if extended, will not pass through said disc.

3,969,228

QUALITY CONTROL MONITOR

Gordon D. Browning, 19056 Stanton Ave., Castro Valley, Calif. 94546

Filed Dec. 30, 1974, Ser. No. 537,199
Int. Cl.² B07C 5/08
U.S. Cl. 209—73 21 Claims

1. Apparatus for detecting a plurality of objects mounted on or proximate to one side of a wall comprising:

means mounted at the opposite side of said wall and transmitting energy thereto;

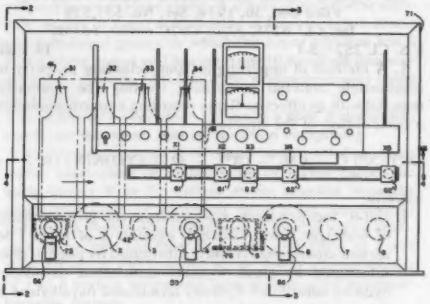
said energy and wall providing for transmission of energy through said wall to said objects, and said energy and objects providing for return energy transmission through said wall;

means receiving said return energy from a plurality of wall areas, each of said areas being associated with one of said objects;

comparator means connected to said return energy receiving means and comparing energy quantities received from said areas;

means connected to said comparator means and responsive to a predetermined dissimilarity between said received energy quantities to provide a rejection signal;

means sensing energy transmission through said wall between spaced points thereon; and



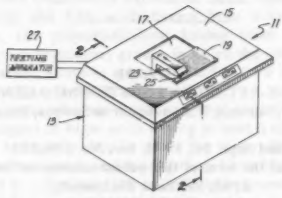
second comparator means connected to said energy transmission sensing means and comparing said energy transmission with a standard and providing an output signal when said energy transmission deviates from said standard by a predetermined amount.

3,969,229

COMPONENT HANDLER WITH AUTOMATIC SORTER

James W. Horner, Long Beach, Calif., assignor to GTI Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1975, Ser. No. 550,479
Int. Cl.² B07C 5/08
U.S. Cl. 209—74 R 13 Claims



1. A component sorting apparatus useable with a testing apparatus wherein the testing apparatus is adapted to test components, said component sorting apparatus comprising:

a supporting structure;

holding means on the supporting structure for holding a plurality of components to be tested at holding locations, respectively, said apparatus having a plurality of component paths beneath at least preselected ones of said holding locations, respectively;

said holding means including movable means for releasing the components at said preselected holding locations from the holding means to allow such components to move under the influence of gravity along the associated component path away from the holding means;

means defining a plurality of separate zones accessible from said component path;

programmable means on the supporting structure responsive to the results of the test of each of the components at said preselected holding locations for directing the components from said component paths into said zones in accordance with the test results; and

said movable means including a plate beneath the holding locations for retaining the components in the holding means, said plate being movable to leave the components at said preselected holding locations unsupported and free to fall along their associated component paths.

3,969,230

BROMINATED CARBAMOYL DERIVATIVES USEFUL TO IMPART FLAME RETARDING PROPERTY TO COMBUSTIBLE SUBSTRATES

Daniel J. Scharf, East Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,528
Int. Cl.² B27K *3/00*; **C07C** *69/00*, *101/00*
U.S. Cl. 252—8.1 **14 Claims**

1. A method of imparting a flame retarding property to a combustible material comprising treating the combustible material with an effective flame retarding imparting amount of a composition of the structure

$$(X^1)\,(X^2)\,C - CH_2 - (R^2)_n - O - C(O)N(R)\,(R^1) \quad (X)$$

wherein:

R and R^1 independently selected from the group consisting of hydrogen, alkyl, alkanol, cycloalkyl of from 5 to 7 carbon atoms, phenyl, alkyl substituted by phenyl, phenyl substituted by alkyl, hydroxy terminated oxyalkylene, hydroxy substituted hydroxy terminated oxyalkylene and halogen substituted hydroxy terminated oxyalkylene;

R^2 is independently selected from the group consisting of alkylene, oxyalkylene, hydroxy substituted oxyalkylene, halogen substituted oxyalkylene and alkylene or oxyalkylene substituted by the group $-O-C(O)N(R)\,(R^1)$;

X, X^1 and X^2 are independently selected from the group consisting of halogen and halogen substituted alkyl, wherein the halogen is chlorine or bromine; said alkyl, alkanol and alkylene each independently has from 1 to 4 carbon atoms; said oxyalkylene having from 2 to 4 carbon atoms; *n* is 0 to 20;

provided one of X, X^1 or X^2 is a bromo or a bromo substituted alkyl; and that each carbamoyl group has a replaceable hydrogen in the R or R^1 group.

3,969,231

FLAME-RETARDANT SOFTENING AGENTS

Peter M. Hay, Summit, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 16, 1974, Ser. No. 506,233
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² D06M *13/26*
U.S. Cl. 252—8.8 **23 Claims**

1. A textile softening agent produced by reacting A) the phosphate compound of the formula:

$$(BrCH_2CHBrCH_2O)_3PO$$

with B) the reaction product of i) a fatty acid or an ester derivative thereof, wherein said fatty acid or ester derivative thereof is selected from the group consisting of:

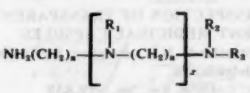
a. a saturated fatty acid of 12 to 22 carbon atoms, or a mixture thereof,

b. a lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 cabon atoms, or a mixture thereof,

c. a mixture of at least one saturated fatty acid of 12 to 22 carbon atoms with one or more monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of monounsaturated fatty acids,

d. a mixture of at least one lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 carbon atoms with one or more lower alkyl (C_1–C_4) or glycerol esters of monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of esters of monounsaturated fatty acids, and

e. mixtures thereof, and ii) a polyamine or mixture of polyamines of the formula II:



wherein

R_1, R_2 and R_3 are independently hydrogen or lower alkyl of 1 to 3 carbon atoms,

n is an integer of 2 or 3, and

x is an integer of 0 to 3,

the mol ratio of the fatty acid or ester derivative thereof expressed as the fatty acyl radical to the polyamine being in the range of 1:1 to 3:1, subject to the proviso that the reaction product of i) and ii) is substantially free of unreacted polyamine, said reaction product produced by the reaction of said fatty acid or ester derivative thereof and said polyamine at a temperature between 100° and 220°C. for a time sufficient to produce substantially the entire amount of water or alcohol theoretically indicated by the fatty acid or fatty ester/amide-forming condensation reaction but not in excess of 36 hours, said reaction product and said phosphate compound being reacted in a weight ratio of from 10:1 to 0.5:1 at a temperature between 30° and 150°C. for a period of time between 2 minutes and 12 hours.

3,969,232

BEARING AND BEARING LINER WEAR RESISTANT COMPLIANT LAYER

Peter H. Turner, Burbank, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed Jan. 25, 1974, Ser. No. 436,651
Int. Cl.² C10M *5/00*, *7/00*; **F16C** *9/06*, *27/00*
U.S. Cl. 252—12.6 **27 Claims**

1. A bearing liner for attachment to a substrate having at least one projection thereon, said bearing liner comprising:

a first wear resistant layer, said first wear resistant layer having a wear surface;

said first wear resistant layer being deformable under load whereby application of said wear resistant layer directly to said substrate would cause the projections to cause a protrusion on the wear surface, the first wear resistant layer including a first porous backing member and an adhesive and a first plurality of particles intimately mixed with the adhesive and providing a low friction and having a sufficiently small size to be mechanically bonded in the pores of the first backing member, the particles being mechanically bonded within the pores of the backing member and being chemically bonded by the adhesive;

a compliant layer disposed between the first wear resistant layer and the substrate, said compliant layer being deformable to permit the compliant layer to at least partially receive the projection whereby the tendency of the projection to cause the protrusion is reduced; and

said compliant layer having a second wear surface, said first wear resistant layer covering said second wear surface until said first wear resistant layer is worn away to expose the second wear surface, the second compliant layer including a second porous backing member and an adhesive and a second plurality of particles intimately mixed with the adhesive and providing a low friction and having a sufficiently small size to be mechanically bonded in the pores of the second backing member, the particles being

mechanically bonded within the pores of the backing member and being chemically bonded in the adhesive.

3,969,233

BIODEGRADABLE INTERNAL COMBUSTION ENGINE LUBRICANTS AND MOTOR FUEL COMPOSITIONS

William J. Lucas, Ridge Road, R.R. No. 1, Birmingham, Mich. 49436

Continuation-in-part of Ser. No. 188,518, Oct. 12, 1971, abandoned, and a continuation-in-part of Ser. No. 38,547, May 26, 1970, abandoned. This application Aug. 23, 1974, Ser. No. 499,902

Int. Cl.[2] C10M *3/18*

U.S. Cl. 252—22 **22 Claims**

1. A hydrocarbon oil-miscible and water-miscible, biodegradable lubricant composition consisting of biodegradable components consisting of at least two members selected from the group of (a) (b) and (c) components;

a. higher carboxylic acids having from 6 to 30 carbon atoms selected from the group consisting of fatty acids, rosin acids, naphthenic acids and tall oil acids in quantity of 5 to 75% by weight;

b. a member selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic primary amines, said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms; said lower alkyl amines being primary, secondary or tertiary alkyl, in quantity of 2 to 25% by weight;

c. soaps of said higher carboxylic acids having a cation selected from the group consisting of ammonium and amine cations, said amine cation being derived from an amine selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic primary amines, said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms, said lower alkyl amines being primary, secondary or tertiary alkyl, said soaps in quantity of 5 to 75% by weight; and in addition at least one each of the (d) (e) and (f) components

d. polyloweralkyleneoxy esters of higher carboxylic acids having from 6 to 30 carbon atoms selected from the group consisting of fatty acids, rosin acids, naphthenic acids and tall oil acids, the lower alkylene group having 2 or 3 carbon atoms, the polyalkyleneoxy groups, in quantity of 0.5 to 25% by weight;

e. polyloweralkyleneoxy esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups, the lower alkylene group having 2 to 3 carbon atoms, in quantity of 0.5 to 25% by weight; and

f. at least 20% by weight of a water-miscible solvent selected from the group consisting of lower alkanols, lower alkyl ketones and a lower polyhydric alcohol having 2 to 4 carbon atoms, said lubricant composition being blended with gasoline as an upper lubricant in quantity between about 0.1 gallon and 5,500 gallons of said lubricant per one thousand barrels of gasolines; said soaps and polyloweralkyleneoxy esters and ethers being present in quantity sufficient to render said composition miscible or emulsifiable in said gasoline.

3. A motor fuel composition containing, per one thousand barrels of gasoline, 0.1 to 5,500 gallons of the biodegradable composition consisting essentially of

a. a diluent selected from the group consisting of lower alkyl ketones, and lowr monohydric alcohols having 1 to 4 carbon atoms in quantity of 20 to 75% by weight;

b. a higher carboxylic acid having 6 to 30 carbon atoms selected from the group consisting of saturated and unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acid in quantity of 10 to 50% by weight;

c. a member selected from the group consisting of lower alkyl amines, lower alkanol amines and hydrocarbyl monocarbocyclic, primary amines said lower alkyl amines and lower alkanol amines having 1 to 6 carbon atoms, said lower alkyl amines being primary, secondary or tertiary alkyl in quantity of 3 to 25% by weight;

d. polyloweralkyleneoxy fatty acid esters in which the lower alkylene has 2 to 3 carbon atoms and the fatty acid has 6 to 30 carbon atoms, and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25% by weight; and

e. polyoxyloweralkylene esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups in which the lower alkylene has 2 to 3 carbon atoms and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25%, said percentages being by weight.

9. The lubricant composition for use as a gear, transmission and crankcase lubricant, said composition comprising

a. 5 to 75 weight percent of alkali metal, alkaline earth metal, ammonium or amine soaps of higher carboxylic acids having 6 to 30 carbon atoms selected from the group consisting of saturated fatty acids, unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acids, said amine selected from the group consisting of lower alkyl amines of 1 to 6 carbon atoms, lower alkanol amines of 1 to 6 carbon atoms and lower hydrocarbyl monocarbocyclic amines;

b. an amine selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, lower alkanol amines of 1 to 6 carbon atoms and hydrocarbyl monocarbocyclic amines in quantity of 2 to 25%;

c. higher carboxylic acids having 6 to 30 carbon atoms selected from the group consisting of saturated fatty acids, unsaturated fatty acids, rosin acids, naphthenic acids and tall oil acids in quantity of 5 to 75%;

d. heavy metal soaps of the carboxylic acids of group (c), the metal being selected from the group consisting of zinc, manganese, copper, cobalt, zirconium and cerium ranging in quantity from 0.001 to 20%;

e. polyoxyalkylene higher carboxylic acid esters or ethers, the acid being selected from the group consisting of saturated and unsaturated naphthenic acids, rosin acids, tall oil acids and fatty acids having from 6 to 30 carbon atoms, the polyoxyalkylene having from 10 to 60 polyloweralkyleneoxy groups in which the alkylene has 2 to 3 carbon atoms in quantity of 0.5 to 25% in which the percentage quantities are by weight;

f. polyoxyloweralkylene esters or ethers of polyhydric alcohols, sugars or sugar acids having at least 6 carbon atoms and 6 hydroxy groups in which the lower alkylene has 2 to 3 carbon atoms, and having from 10 to 60 alkyleneoxy groups in quantity of 0.5 to 25%, said percentages being by weight.

3,969,234

LUBRICANT AND MOTOR FUEL ADDITIVES

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 8, 1975, Ser. No. 610,967

Int. Cl.[2] C10M *1/40;* **C10L** *1/22;* **C10M** *3/34*

U.S. Cl. 252—33 **14 Claims**

1. As a new composition, an oil-soluble boron-containing composition having a boron concentration in the range of 0.75 to 1.5 percent by weight which is the reaction product obtained upon reacting

a. a petroleum sulfonic acid,

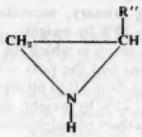
b. a polyamine selected from the group consisting of

1. amines of the formula

$H_2N[(CH_2)_xNH]_yH$

wherein x equals 2–6 and y equals 1–100, and

2. polymers of alkylene imines of the formula



wherein R'' is selected from hydrogen and alkyl radicals having 1–14 carbon atoms, and

c. a boron compound.

3,969,235

SULFURIZED CALCIUM ALKYLPHENOLATE COMPOSITIONS

Rodney L. Sung, Fishkill; Harry Chafetz, Poughkeepsie; Benjamin H. Zoleski, Beacon, and Walter D. Foucher, Jr., Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

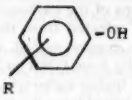
Filed Aug. 26, 1974, Ser. No. 500,965

Int. Cl.² C10M *1/38*

U.S. Cl. 252—42.7 **11 Claims**

1. A lubricating oil composition comprising a hydrocarbon oil of lubricating viscosity containing between about 0.1 and 90 wt. % of a sulfurized calcium alkylphenolate, said alkylphenolate having a calcium metal ratio of about 1 to 1, a calcium content between about 1 and 8 wt. % and a sulfur content between about 0.5 and 12 wt. % wherein said sulfurized calcium alkylphenolate is produced by:

1. first contacting an alkylphenol



where R is alkyl of from 5 to 50 carbons with a first addition of calcium alkoxyalkoxide of the formula:

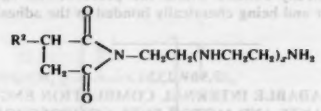
$$CaO\text{-}A\text{-}OR')_2$$

where A is alkanediyl of from 1 to 6 carbons and R' is alkyl of from 1 to 25 carbons at a first temperature between about 200° and 420°F. utilizing a mole ratio of calcium alkoxyalkoxide to said alkylphenol of between about 0.225:1 and 0.45:1,

2. second contacting the resultant mixture with sulfur in the presence of hydrocarbon lubricating oil at a second temperature between about 440° and 460°F. utilizing a mole ratio of sulfur to initial alkylphenol of between about 0.5:1 and 8:1, said hydrocarbon oil in said second contacting constituting between about 13 and 20 wt. % of said reaction mixture and

3. subsequently third contacting the mixture with a second addition of calcium alkoxyalkoxide at said first temperature in a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.15:1 and 0.375:1 in sufficient amount so that the total calcium alkoxyalkoxide employed in the first and third contacting will total a mole ratio of calcium alkoxyalkoxide to initial alkylphenol of between about 0.5:1 and 0.6:1.

7. A lubricating oil composition in accordance with claim 2 containing between about 0.1 and 10 wt. % said sulfurized calcium alkylphenolate, and between about 1 and 10 wt. % of a supplementary dispersant selected from the group consisting of 1). ethoxylated inorganic phosphorus acid free, steam hydrolyzed polybutene (800-2500 mw.)-P_2S_5 reaction product, said ethylene oxide moiety being present in respect to said hydrolyzed polybutene-P_2S_5 reaction product in a mole ratio of about 1:1 and polybutene-P_2S_5 component being present in a mole ratio to one another of between about 1:1, 2). and an alkenyl succinic anhydride derivative of alkylene polyamine characterized by the formula:



where R^2 is alkenyl of from 50 to 200 carbons, x is an integer of from 0 to 10.

3,969,236

COMPOSITIONS CONTAINING MONOALKANOLAMIDE BORATES

David A. Waldstein, 622 Bergen Ave., Jersey City, N.J. 07607

Filed Mar. 13, 1974, Ser. No. 450,565

Int. Cl.² C10M *1/06*

U.S. Cl. 252—49.5 **3 Claims**

1. A composition comprising a liquid carrier selected from the group consisting of oil-in-water emulsions and water-in-oil emulsions, and a rust-inhibiting-effective amount of an alkanolamide borate which is the reaction product of orthoboric acid and a primary alkanolamine selected from the group consisting of monomethanolamine, monoethanolamine, 1-isopropanolamine, mono-n-propanolamine and 2-amino-2-methyl-propanolamine in a ratio of 1 gram mole of boric acid to 1 to 2 gram moles of alkanolamide, the reaction taking place in a closed reactor for about 4 to 5 hours at a temperature between about 130° C to about 165° C with the water formed being removed during the reaction.

3,969,237

LUBRICANT COMPOSITIONS CONTAINING BENZOTRIAZOLE DERIVATIVES AS COPPER PASSIVATORS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 344,007, March 22, 1973, abandoned. This application Jan. 4, 1974, Ser. No. 430,870

Int. Cl.² C10M *1/10*

U.S. Cl. 252—49.9 **14 Claims**

1. A lubricant composition comprising a major proportion of an oil lubricating viscosity and greases thereof and normally susceptible of corroding copper, containing, in an amount sufficient to inhibit such corrosion, the reaction product of (A) benzotriazole and (B) a reactant selected from the group consisting of hydrocarbyl carboxylic acids having at least 18 carbon atoms, mono and di-substituted hydrocarbyl phosphates and mono and di-substituted organic phosphonates wherein the hydrocarbyl substituent contains at least 15 carbon atoms, and wherein said reaction is conducted at a temperature from about 100°C to about 200°C and in a mole ratio of (A) to (B) of from about 1:1 to about 1:0.5.

3,969,238

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY AND PROCESS FOR DEVELOPING LATENT IMAGES

Terukuni Tsuneda, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1973, Ser. No. 387,473

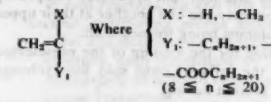
Claims priority, application Japan, Aug. 15, 1972, 47-81728; Aug. 15, 1972, 47-81729

Int. Cl.² G03G *9/12, 13/10*

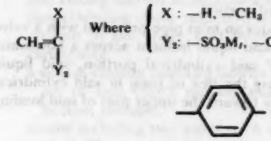
U.S. Cl. 252—62.1 L **14 Claims**

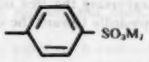
1. A liquid developer for electrophotography comprising toner particles dispersed in a highly insulating carrier liquid having therein an addition polymer produced from at least one member selected from the monomers of the formula (1) and at least one member selected from the monomers of the formula (2):

General formula (1)



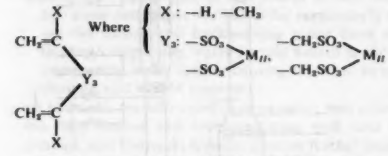
General formula (2)

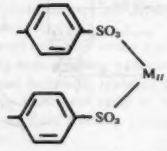




(M_I is alkali metal or $-NH_4$)

Or





(M_{II} is alkaline earth metal).

3,969,239

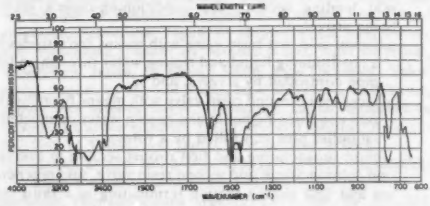
METHOD FOR USING MACROAMINE POLYMERS AS FLOCCULATING AGENTS

Isao Shinohara, and Juro Aoyagi, both of Tokyo, Japan, assignors to B. R. Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 479,631, June 17, 1974, Pat. No. 3,933,717, which is a continuation-in-part of Ser. Nos. 323,731, Jan. 18, 1973, abandoned, and Ser. No. 345,122, March 26, 1973, abandoned. This application July 9, 1975, Ser. No. 594,841

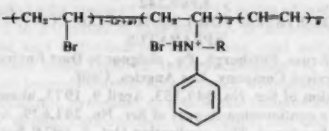
Int. Cl.² B01D *21/01*

U.S. Cl. 210—54 **4 Claims**



1. In a process for treating water to remove dissolved and suspended impurities including metallic ions, bentonite or dyestuffs by floculation, the improvement comprising

a. dissolving in said water an effective amount of a water soluble linear macroamine polymer consisting essentially of a structural unit shown by the following formula:



wherein R represents alkyl group containing 1 to 4 carbon atoms, x is a mol decimal fraction between about 0.65 and 0.95, and y is a mol decimal fraction between about 0.23 and 0.04, and

b. separating floc formed in step (a) from said water.

3,969,240

POLYSILOXANE MEMBRANE LUNG

Theodor Kolobow, Rockville, Md.; Fusakazu Hayano, Tokyo, Japan, and Paul Weathersby, Rockville, Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,786

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—22 A **7 Claims**

1. In an artificial membrane lung having blood contacting surfaces, including a pair of spaced silicone rubber membranes formed of silica filled silicone, the improvement wherein said silica filled silicone rubber is coated with a polydimethylsiloxane gum having no silica filler.

3,969,241

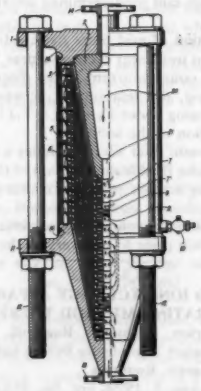
METHOD OF AND APPARATUS FOR SEPARATING CHEMICAL SOLUTIONS IN MEMBRANE PROCESSES

Michal Skrabak; Ernest Vavrik; Stanislav Kolarik, and Milos Mazak, all of Bratislava, Czechoslovakia, assignors to Slovenska Vysoka Skola Technicka, Bratislava, Czechoslovakia

Filed July 29, 1974, Ser. No. 492,407

Int. Cl.² B01D *31/00*

U.S. Cl. 210—23 H **3 Claims**



1. A method of separating chemical solutions in membrane processes of the type including reverse osmosis, ultrafiltration and electrodialysis, comprising flowing the solution serially through a plurality of nested frustoconical membrane-lined ducts whereby the solution flows alternately outwardly and inwardly through adjacent ducts, and separating components from said solution through the membrane lining of each duct.

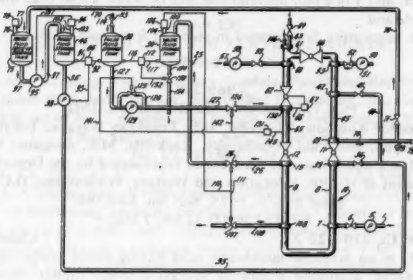
3,969,242
CONTROL SYSTEM FOR LIQUID-SOLID CONTACTING APPARATUS

David C. Kruse, Pittsburgh, Pa., assignor to Dart Environment and Services Company, Los Angeles, Calif.

Continuation of Ser. No. 349,153, April 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 241,639, April 6, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,336

Int. Cl.[2] B01D *15/02*

U.S. Cl. 210—25 17 Claims



1. A method of controlling the position of liquid-liquid interfaces in a cyclical process employing a liquid-solids contacting apparatus comprising a loop having a pulsing section, a loading section, and a stripping section, at least a major portion of said loop being filled with a solid sorption medium, wherein during a pulse cycle solids are moved a predetermined distance corresponding to volume V_P by means of a pulse fluid introduced to the pulsing section, and wherein during a treatment cycle feed containing at least one sorbable material and at least one non-sorbable material is introduced to the loading section, stripping fluid is introduced to the stripping section, a first product comprising sorbable material is recovered from a location between the feed and stripping fluid inlet points and a second product comprising non-sorbable material is recovered from a location between the feed and pulse fluid inlet points, which method comprises:

a. measuring the volume V_{PL} of pulse fluid necessary to move the solids said predetermined distance V_P during a pulse cycle;

b. after completion of said pulse cycle introducing during the subsequent treatment cycle a volume V_R of rinse fluid into the loop countercurrent to the direction of flow of said pulse fluid, the relationship between volumes V_R, V_{PL}, and V_P being about $V_R = V_{PL} - V_P(1-\alpha)$, where α is the void fraction of the solids,

c. removing a waste fluid which includes a substantial portion of said pulse fluid from a section of the loop adjacent to said pulsing section prior to recovery of the second product, and

d. recovering about a volume V_R of rinse fluid from the stripping section prior to recovery of the first product.

3,969,243
MOVING BED ION-EXCHANGE APPARATUS AND OPERATING METHOD THEREOF

Nicolae Mihail Arion, Bucharest, Romania, assignor to Institutul de Proiectari Tehnologice Pentru Industria Chimica-Iprochim, Bucharest, Romania

Filed Aug. 5, 1974, Ser. No. 495,070

Claims priority, application Romania, Aug. 6, 1973, 75734

Int. Cl.[2] B01D *15/02*

U.S. Cl. 210—25 6 Claims

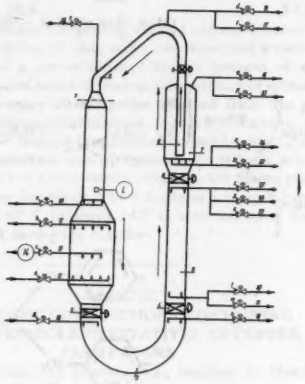
1. An ion-exchange apparatus having therein a movable bed of an ion-exchange resin for treating an ion-containing liquid influent for loading the ion-exchange resin with ions from said influent followed by regeneration of the ion-exchange resin and recovery of an effluent from said resin constituting a concentrated solution of said ion, said apparatus comprising two vertical columns connected to one another at their upper and lower ends, said columns being formed with:

a. a loading first section for the loading of the preselected kind of ion from the influent onto said ion-exchange resin, said loading section having:

a central cylindrical portion terminating at its top and bottom in tapered portions,

a first resin valve at a lower part of said column adjacent the lower tapered portion,

means which includes an inlet pipe provided with a valve for introducing said liquid influent across a horizontal cross section of said cylindrical portion, said liquid influent traversing the bed of resin in said cylindrical portion upwardly toward the upper part of said loading



section, said means further including an outlet pipe provided with a valve for removing said liquid influent over the horizontal cross section of said upper part, and

a sample-removing pipe for continuously removing a sample of flowing influent connected to said cylindrical portion at a level of about two thirds the height of said bed, said sample-removing pipe being connected to an analyzer responsive to the concentration of said preselected kind of ion in the liquid influent;

b. a conditioning-rinsing second section extending from said first resin valve along the portion of the apparatus connecting said columns at the bottoms thereof and terminating at a second resin valve provided at the lower end of the second column, said conditioning-rinsing section being constructed and arranged to receive by hydraulic transfer a batch of the ion-exchange resin exhausted in said loading section, the conditioning-rinsing section being provided:

adjacent said first resin valve with means for introducing a conditioning liquid and rinsing water through an inlet pipe controlled by a valve, and

adjacent said second resin valve with means for removing said conditioning liquid and rinsing water connected to an outlet pipe controlled by a valve;

c. a third regenerating and first rinsing section in said second column above said second resin valve, said regenerating and first rinsing section terminating at a third resin valve in said second column, said resin batch being hydraulically displaced upwardly from said conditioning-rinsing section to said regenerating and first rinsing section, said regenerating and first rinsing section comprising:

first distributing means adjacent third resin valve and including a cylindrical filter connected to three pipes each controlled by a respective valve for feeding strongly concentrated liquid regenerating agent, rinsing

water and inert gas into the resin batch, the fluids thus introduced passing downwardly through the resin batch in said regenerating and first rinsing section, and

second distributing means adjacent said second resin valve and including a cylindrical filter connected to two conduits each controlled by a respective valve for discharging an effluent concentrated in eluted salts and excess regenerant;

d. a final-rinsing fourth section for the final rinsing and backwashing of the ion-exchange resin upon regeneration and rinsing thereof in said third section, said fourth section extending above said third resin valve in said second column to the upper part thereof, said fourth section comprising:

a siphon conduit reaching downwardly through the interior of said fourth section and opening close to the bottom thereof,

means including two pipes each controlled by a respective valve for respectively introducing rinsing and backwashing water into said fourth section at a lower part thereof and for the discharge of compacting water at the lower part of said fourth section, and

means at an upper part of said fourth section including two pipes and respective values for respectively removing the rinsing and backwashing water from and for feeding compacting water to said fourth section, said compacting water further causing the resin to transfer through said siphon conduit;

e. an hydraulic transfer conduit connecting said columns at the tops thereof and communicating with said siphon conduit, said hydraulic transfer conduit further including:

a fourth resin valve connecting said hydraulic transfer conduit to said siphon conduit,

means including at least one pipe and a pair of valves for respectively feeding resin shifting water and resin compacting water to said hydraulic transfer conduit, and

means for introducing additional resin to said apparatus at an end of said hydraulic transfer conduit connected to said first column; and

f. a resin-storage fifth section formed in said first column above said first section and communicating with said end of said hydraulic transfer conduit, said fifth section comprising:

a tapered portion at the upper end of said fifth section connecting same with said hydraulic transfer conduit,

a resin/water interface sensor at a lower portion of said fifth section for detection of the advance of a resin/interface from the top of said fifth section toward said first section, and

means including a pipe and a valve at the bottom of said fifth section for removing transfer water.

3,969,244

METHOD OF ADSORBING HEAVY METALS

Yoshitaka Kobayashi, Yokohama, Japan; Kinjiro Sugai, deceased, late of Yokohama, Japan; by Katsuno Suqai, legal successor, Yokohama, Japan; by Hajime Sugai, legal successor, Yokohama, Japan; by Minoru Sugai, legal successor, Yokohama, Japan; by Shunji Sugai, legal successor, Yokohama, Japan; by Hiroshi Sugai, legal successor, Yokohama, Japan, and Minoru Sugai, Yokohama, Japan, assignors to Hokuetsu Carbon Industry Co., Ltd and Yoshitaka Kobayashi, both of Yokohama, Japan, part interest to each

Continuation of Ser. No. 357,620, May 7, 1973, abandoned, which is a division of Ser. No. 149,772, June 3, 1971, abandoned. This application May 12, 1975, Ser. No. 576,332

Claims priority, application Japan, June 9, 1970, 45-50105; Apr. 9, 1971, 46-21766

Int. Cl.² C02B *1/14*

U.S. Cl. 210—38 B **9 Claims**

1. A method of removing a heavy metal from an aqueous solution of a salt of said heavy metal which comprises contacting said solution with a particulate resin, said resin essentially consisting of a polycondensation product of a sulfur-bearing constituent, a hydroxy- or aminobenzene, and an aldehyde, said resin being prepared from 1 to 15 moles of said aldehyde and 0.2 to 2.0 moles of said hydroxy- or aminobenzene per mole of said sulfur-bearing constituent, said sulfur-bearing constituent being thiourea, thiosemicarbazide, or thiocarbazide, and hydroxybenzene being phenol, hydroquinone, resorcinol, catechol, pyrogallol, or cresol, said aminobenzene being aniline, m-phenylenediamine, or toluidine, and said aldehyde being formaldehyde, paraldehyde, acetaldehyde, benzaldehyde, or furfural.

3,969,245

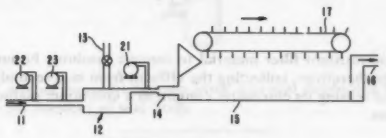
ELECTROCOAGULATION SYSTEM FOR REMOVING POLLUTANTS FROM WASTEWATER

Ernest R. Ramirez, Lemont, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Oct. 21, 1974, Ser. No. 516,176

Int. Cl.² B01D *5/00*

U.S. Cl. 210—44 **11 Claims**



1. A method for removing pollutants from raw wastewater comprising the steps of: providing a bubble supply produced electrolytically by decomposing a flow of wastewater; positioning said bubble supply as a cylindrically shaped dense zone of fine bubbles, said positioning being longitudinal along the flow of wastewater; rapidly flowing said wastewater through said dense zone of fine bubbles; simultaneously turbulently contacting said fine bubbles with pollutants within said wastewater while said wastewater flows through said zone, thereby forming a buoyant embryo floc within said wastewater, said embryo floc remaining unseparated from said flow of wastewater; venting said zone to atmosphere to prevent pressure buildup within said zone; then removing said unseparated flow of wastewater and embryo floc out of said dense zone of fine bubbles whereby some of said buoyant embryo floc is combined into a buoyant full floc; introducing said full floc and wastewater into a downstream flotation basin without realizing any appreciable pressure differential, whereby the buoyant full floc rises to near the surface of the wastewater in a manner approximating a laminar flow; and then clarifying the wastewater by separating the full floc from the wastewater, said clarifying step being the initial removal of floc from the flow of wastewater.

3,969,246

CHROMIUM REMOVAL AND RECOVERY PROCESS

Edward J. Feltz, Dayton, and Ross Cunningham, Mount Gilead, both of Ohio, assignors to John Cunningham, Portsmouth, Ohio

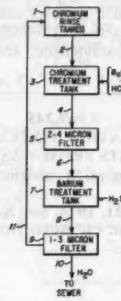
Filed Aug. 26, 1974, Ser. No. 500,606

Int. Cl.² C02C *5/02*

U.S. Cl. 210—45 **9 Claims**

1. A process for removing chromium from waste water comprising determining the chromium content thereof, contacting said chromium-containing water with barium carbonate and acetic acid in aqueous media at a pH ranging from about 3 to about 6 utilizing a weight concentration of barium carbonate to chromium present ranging from about 1.5 to 3.5:1 and a weight ratio of barium carbonate to acetic acid ranging from about 2 to 4:1 thereafter filtering the resultant insoluble chromium material with a first acid-resistant filter media having openings ranging from about 0.5 to 6 microns, recovering the filtered chromium and removing the barium

present by contacting said chromium with sulfuric acid thereby converting said chromium to chromic acid and precipitating said barium as insoluble barium sulfate, passing said effluent from said sulfuric acid contact through a second



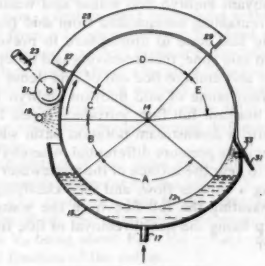
acid-resistant filter material to remove insoluble barium sulfate therefrom, collecting the effluent from said second filter, and reusing its chromium content in a chromium plating process.

3,969,247

VACUUM FILTRATION PROCESS

Robert C. Emmett, Jr., Salt Lake City, and Benjamin K. Pocock, Tooele, both of Utah, assignors to Envirotech Corporation, Menlo Park, Calif.

Filed June 20, 1975, Ser. No. 588,923
Int. Cl.[2] B01D *33/06*
U.S. Cl. 210—68 **3 Claims**



1. An improved process for dewatering a cake of solids that is formed on the filter medium of the drum of a rotary drum vacuum filter that is disposed for rotation in partial submergence in a slurry containing suspended solids, said process comprising the steps of:

a. drawing air through the cake of solids on the surface of the filter drum after the drum is rotated out of submergence from the slurry in order to partially dry the filter cake;

b. then, pressing the filter cake against the surface of the drum by means of a pressure-applying roll which is driven to rotate so that its surface velocity exceeds the velocity of the drum surface by 25 to 75%;

c. thereafter, drawing steam through the filter cake while it is still on the surface of the filter drum; and

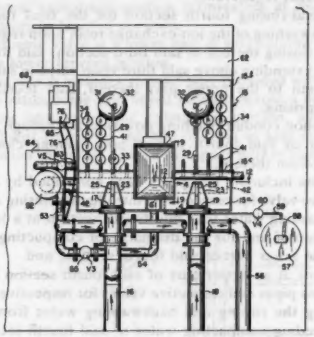
d. then, discharging the steamed filter cake from the surface of the filter drum.

3,969,248

POOL FILTERING SYSTEM

Charles C. Whitmer, Strongsville, Ohio, assignor to The Whitmer Company, Cleveland, Ohio

Filed Nov. 1, 1974, Ser. No. 520,017
Int. Cl.[2] E04H *3/16;* **B01D** *29/38*
U.S. Cl. 210—126 **3 Claims**



1. A pool filtering system including a two-part filter tank with a partition between the parts, the first part of the tank forming a stilling chamber and the second part forming a filter element tank, two inlet lines leading from a pool to said stilling chamber, one inlet line communicating with the bottom of the pool and the other line communicating with a wave trough of the pool, a plurality of vertical filter elements in said filter element portion of said tank, each of said filter elements having over substantially its entire length an inner strong coarse perforate metallic layer completely covered by a fine mesh outer layer sufficiently fine to receive and hold diatomaceous silica, each cylinder having an imperforate top at its upper end and having a bottom closure at its lower end with a single through opening, a manifold including a main line and branch lines communicating therewith in the bottom of said second portion of said tank, said filter elements having detachable connections with suitable openings in said manifold branches, each of said filter elements being sufficiently strong to withstand a pressure differential of about **150** pounds per square inch, a recirculating pump connected with said manifold line as an inlet and with an outlet line leading to said pool, a control valve where each of said inledt lines enters into said stilling chamber, a control valve there comprising a valve seat having a continuous annular ridge of uniform height extending at a vertical plane and a coacting valve having a continuous flat surface in a parallel vertical plane opposite said ridge, a valve actuator comprising a generally horizontal toggle having one link with a pivotal connection fixed relative to said flat surface and having another link with a pivotal connection fixed relative to said tank and said links having a common pivotal connection with a strut extending from said connection upwardly, a float for controlling each of said inlet lines independently, an arm adjustable as to length and extending between each of said floats and a point fixed relative to said tank, the upper end of said strut being pivotally connected to said arm, a continuous regulated feeder for diatomaceous silica mounted above said tank and discharging thereinto, means for recycling water containing diatomaceous silica directly out of and back into said tank while forming an outer coating of diatomaceous silica on said filter elements, a compressed air reservoir, means for providing a supply of compressed air in said reservoir, a back-wash line leading from said reservoir to said manifold, a quick-opening valve in said back-wash line and means for isolation said manifold from said inlet and outlet lines during back-wash, whereby to intermittently explode said air in all of said filter elements outwardly to remove the dirt-contaminated diatomaceous silica

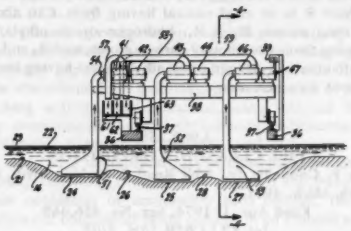
outer coating from said filter elements when necessary, said tank being open at the top whereby to inspect said filter elements and to wash the same with a hose to remove diatomaceous silica particles after back-washing when necessary, and a drain from the bottom of said tank for removing said waste diatomaceous silica material.

3,969,249

SOLIDS REMOVER FOR HIGH RATE ALGAE PONDS

Joseph C. Dodd, 117 Powell Drive, Werribee, Victoria 3030, Australia

Filed Apr. 9, 1975, Ser. No. 566,239
Int. Cl.² F02B *15/04*
U.S. Cl. 210—170 **6 Claims**



1. A solids remover for high rate algae ponds comprising banks forming an elongated pond having a bottom, means forming in said bottom a settling basin and physically defining in said basin a plurality of man-made zones longitudinally spaced apart axially along the length of said pond and said spaced apart zones having bottoms at different elevations for the settlement of different solids, a carriage, means for supporting said carriage for movement across said settling basin, pumping means on said carriage, a stationary solids receiving means extending across said settling basin, means for conducting discharge from said pumping means to said receiving means, and means for conducting solids from a selected one of said zones to said pumping means.

3,969,250

APPARATUS FOR PREPARING LIQUID SAMPLES FOR ANALYSIS IN AUTOMATIC ANALYZERS

Andrew F. Farr, 9321 Montemar Drive, Spring Valley, Calif. 92077

Filed Mar. 10, 1975, Ser. No. 556,784
Int. Cl.² B01D *33/00*
U.S. Cl. 210—359 **9 Claims**

1. An apparatus for separating a clear blood serum free from fibrin strands and other suspended solids comprising

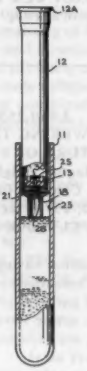
a. an outer tubular member, closed at the lower end;

b. a plunger tube longitudinally movable within said outer member;

c. a piston head attached to the lower end of said plunger tube, said piston head comprising a body having a cup-shaped upper portion with a depending skirt whose outer surface fits inside the lower end of said plunger tube, said body also having a depending tubular member communicating with said cup-shaped upper portion of the body through an apertured valve seat projecting upwardly to at least the height of the rim of said upper portion;

d. a flexible sealing ring whose outer periphery makes sliding sealing contact with the inside wall of said outer tubular member, said ring being frictionally attached to and movable axially on the outer surface of the said depending tubular member of said body;

e. an elastic membrane extending across said cupped upper portion of the body so that said membrane covers the opening of said valve seat, said membrane having at least one opening therethrough positioned away from the valve seat; and



f. a filter means frictionally fitted into said depending tubular member of said body.

3,969,251

DEVELOPER MIXTURE

Lewis O. Jones, Webster, and Robert Mermelstein, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,488
Int. Cl.² G03G *9/02*
U.S. Cl. 252—62.1 P **15 Claims**

1. An electrostatographic developer mixture comprising toner particles electrostatically clinging to the surface of carrier materials, said toner particles comprising toner particles classified as to particle size wherein said toner particles have a particle size number distribution fine index ratio of less than about 2.50, a particle size volume distribution coarse index ratio of less than about 1.50, and a particle size distribution wherein less than about 30.0 percent by number of the toner particles have an average particle size diameter of less than about 5 microns, about 25 percent by number of the particles have a diameter between about 8 microns and about 12 microns, and less than about 5 percent by number of the toner particles have an average particle diameter greater than about 20 microns, said carrier materials comprise carrier particles classified as to surface area having a specific surface area of at least about 150 cm^2/gram, a particle size volume distribution geometric standard deviation of less than about 1.3, and a volume average particle diameter of less than about 100 microns, said developer mixture being further characterized as experiencing substantially reduced toner impaction rates resulting in more stable triboelectric charging properties for substantially longer periods of time thereby increasing the developer life of said developer mixture.

3,969,252

DIELECTRIC CERAMIC COMPOSITIONS OF $BATIO_3$-$BAZRO_3$-$CATIO_3$ SYSTEM

Kazuaki Utsumi, and Tomeji Ohno, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,040
Claims priority, application Japan, Sept. 19, 1973, 48-106204
Int. Cl.² H01B *3/00;* **B61C** *11/00*
U.S. Cl. 252—63.2 **1 Claim**

1. A method of improving the time stability of permittivity properties of a dielectric ceramic consisting essentially of a composition determined by the general formula: $(BaTiO_3)_x$-

$.(BaZrO_3)_y.(CaTiO_3)_z$, wherein $x+y+z = 1.0$ and x, y and z have the following ranges, respectively: $0.4 \leq x \leq 0.89$, $0.1 \leq y \leq 0.3$ and $0.01 \leq z \leq 0.3$ which comprises, adding to said composition between 0.001 wt.% to 0.5 wt.% SiO_2 and between 0.01 mol% to 3 mol% TiO_2.

3,969,253

METHOD FOR LOWERING THE MINIMUM POUR TEMPERATURE OF FATTY ACIDS

Erwin S. Poklacki, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 2, 1974, Ser. No. 430,294
Int. Cl.² C09K *50/06*
U.S. Cl. 252—77 **5 Claims**

1. A fatty acid composition having a lowered minimum pour temperature consisting essentially of a fatty acid and from 5 to 50 parts per hundred parts of fatty acid of at least one 2 to 18 carbon atom acyclic amine having the structure $R_1R_2R_3N$ wherein R_1, R_2 and R_3 are independently selected from the group H and C_1–C_6 lower alkyl.

3. A method for lowering the minimum pour temperature of fatty acids comprising mixing therewith from 5 to 50 parts by weight per hundred parts of fatty acid of at least one 2 to 18 carbon atom acyclic amine selected from the group consisting of $R_1R_2R_3N$ and $R_1R_2NR_4NR_1R_2$ wherein R_1, R_2 and R_3 are independently selected from the group H and C_1–C_6 lower alkyl and R_4 is a C_1–C_6 alkalene radical.

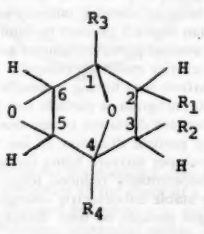
3,969,254

CHEMICAL COMPOUNDS

John F. Herber, St. Louis; Robert W. Street, and William R. Richard, Jr., both of Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 454,649, March 25, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,950
Int. Cl.² C10M *3/40, 3/20;* **C07D** *307/12*
U.S. Cl. 252—78 **15 Claims**

1. A compound represented by the following formula

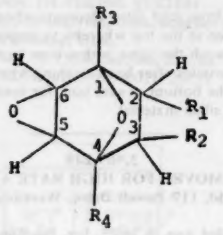


wherein R_1 is $-(CH_2)_{0\text{-}3}-C(O)OR$, $-C(O)R$, or CH_2OR wherein R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen or an alkyl radical having from 1 to 9 carbon atoms and R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to 4 carbon atoms; when R_1 is $-(CH_2)_0-C(O)OR$ R_2 is not H or $-(CH_2)_0-C(O)OR$.

4. A hydraulic fluid composition comprising

A. at least about 50 percent by weight of a base stock material selected from the group consisting of esters and amides of an acid of phosphorus, di- or tricarboxylic acid esters, esters of polyhydric compounds, and mixtures thereof, and

B. from about 0.1 to 10 percent by weight of an epoxide compound represented by the structure



wherein R_1 is $-(CH_2)_{0\text{-}3}-C(O)OR$, $-C(O)R$, or $-CH_2OR$ where R is an alkyl radical having from 1 to about 18 carbon atoms, R_2 is R_1, hydrogen or an alkyl radical having from 1 to about 9 carbon atoms, and R_3 and R_4 are individually hydrogen or an alkyl radical having from 1 to about 4 carbon atoms.

3,969,255

PIPE CLEANING COMPOSITION

George F. Connelly, Jr., Golf Road & Perkins Blvd., Grand Beach, Mich. 49117

Filed Apr. 1, 1974, Ser. No. 456,468
Int. Cl.² C02B *5/06, 5/02*
U.S. Cl. 252—87 **12 Claims**

1. A pipe cleaning composition comprising an aqueous solution containing from about 7.5 to 25 parts by weight of hydrochloric acid, and a combination of inhibitors consisting essentially of 0.6 to 2.6 parts by weight of furfural, 0.5 to 1.4 parts by weight of a dialkylthiourea wherein the alkyl groups contain up to about 4 carbon atoms, and 0.05 to 0.21 parts by weight of benzyl thiocyanate.

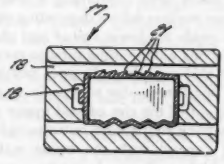
6. A method of removing a scale deposit from metal surfaces normally in contact with water, which deposit includes at least one alkaline earth metal carbonate, which method comprises contacting said scale deposit with an aqueous composition containing from about 7.5 to 25 parts by weight of hydrochloric acid, and a combination of inhibitors consisting essentially of about 0.6 to 2.6 parts by weight of furfural about 0.5 to 1.4 parts by weight of dialkylthiourea wherein the alkyl groups contain up to about 4 carbon atoms, and about 0.05 to 0.21 parts by weight of benzyl thiocyanate, whereby said deposit is dissolved and/or dispersed.

3,969,256

SOAP SAVER

Harry A. Hadley, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 15, 1974, Ser. No. 433,515
Int. Cl.² C11D *17/02, 17/04*
U.S. Cl. 252—92 **1 Claim**



1. A bar of soap comprising a hollow plastic shell in combination with soap material molded about said shell, including a jagged surface on the surface of said shell wherein the jagged surface is formed by irregular shaped teeth on the shell sur-

face, further including longitudinal and transverse channels which intersect, wherein some of said channels communicate with the jagged surface and the outer surface of the bar of soap thereby generating turbulance for improved lathering purposes.

3,969,257

WASHING AND BLEACHING COMPOSITION CONTAINING BLEACH, ACTIVATOR AND A NITRILOTRICARBOXYLIC ACID COMPOUND

Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 165,700, July 23, 1971, abandoned, which is a continuation of Ser. No. 685,285, Nov. 24, 1967, abandoned. This application July 24, 1973, Ser. No. 382,065

Int. Cl.[2] D06L *3/00;* **C01B** *13/00;* **C11D** *7/54*

U.S. Cl. 252—102 **12 Claims**

1. A bleaching composition consisting essentially of (1) a stable, water-soluble inorganic peroxide bleaching agent, (2) an activator capable of reaction with said peroxide in aqueous media whereby to form oxidizing species capable of providing bleaching activity, said activator being selected from the group consisting of N-acetyl phthalimide, N-benzene-sulfonyl phthalimide, N-acetyl succinimide, and N-benzoyl succinimide and (3) a nitrilotricarboxylic compound selected from the group consisting of nitrilotriacetic acid and water-soluble sodium potassium or ammonium salts thereof, the nitrilotricarboxylic compound being present in an amount sufficient to improve the bleaching effectiveness of the composition, the activator-peroxide mol ratio being within the range of from about 0.01 to about 2.0, and the nitrilotricarboxylic compound-peroxide mol ratio being within the range of from 0.001 to 0.10.

6. A bleaching composition consisting essentially of (1) a stable, water-soluble inorganic peroxide bleaching agent, (2) an activator which is an organic carboxylic imide capable of reaction with said peroxide in aqueous media whereby to form oxidizing species capable of providing bleaching activity and (3) a compound selected from the group consisting of nitrilotriacetic acid and water-soluble sodium potassium or ammonium salts thereof, the nitrilotricarboxylic compound being present in an amount sufficient to improve the bleaching effectiveness of the composition, the activator-peroxide mol ratio being within the range of from about 0.01 to about 2.0 and the nitrilotricarboxylic compound-peroxide mol ratio being within the range of from 0.001 to 0.10.

3,969,258

LOW FOAMING ACID-ANIONIC SURFACTANT SANITIZER COMPOSITIONS

Carmen Maneclang Carandang, and George Roman Dychdala, both of Norristown, Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 10, 1974, Ser. No. 513,544

Int. Cl.[2] C11D *1/22, 3/48*

U.S. Cl. 252—106 **8 Claims**

1. The anti-microbial sanitizer composition consisting essentially of a mixture, based on 100 parts by weight thereof, of:

5 to 25 parts of

a. anti-microbial anionic surfactant or a mixture of anti-microbial anionic surfactants including a normally high foaming anionic surfactant, selected from the group consisting of C_7–C_{18}-alkyl-benzene sulfonic acid, salts thereof and mixtures of said acid or salts with an alkyl- or alkenyl-phenoxy benzene disulfonic acid, naphthalene sulfonic acid, alkyl- or alkenyl-naphthalene sulfonic acid;

30 to 50 parts of

b. an acid selected from the group consisting of phosphoric acid, hydrochloric acid, hydroxyacetic acid, sulfuric acid, diglycolic acid, lactic acid, acetic acid and sulfamic acid;

2 to 15 parts of

c. a C_8–C_{18}-aliphatic alcohol, a C_8–C_{18}-alkylphenol or mixture thereof; and

0.5 to 10 parts of

d. a trivalent compound of iron and aluminum selected from the group consisting of ferrous aluminum sulfate, aluminum sulfate and aluminum hydroxide;

said components (c) and (d) being compatible in said composition and present in amounts sufficient to reduce foam formation in said composition compared to the foam formation which occurs in the absence of said (c) and (d) components.

3,969,259

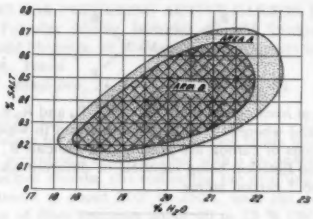
TRANSPARENT SOAP BAR

Robert E. Lages, Paramus, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,179

Int. Cl.[2] C11D *9/44, 9/50, 13/08*

U.S. Cl. 252—107 **4 Claims**



1. In a process for preparing a transparent soap bar wherein said transparency is achieved by a transparency aid selected from the group consisting of sucrose, sorbitol, glycerol, potassium soap or mixtures thereof, or by the conversion of mechanical energy to heat energy, and wherein said soap is chipped, mixed, plodded, extruded, and stamped,

the improvement comprising rendering said soap germicidal by the steps of:

i. preparing a visually clear solution of 1 part by weight of the germicide 2,4,4'-trichloro-2'-hydroxy diphenyl ether in about 0.7 to about 25 parts by weight of a liquid, pleasantly odorous substance, and

ii. incorporating said visually clear solution into said soap prior to the completion of the plodding thereof, the proportions of said 2,4,4'-trichloro-2'-hydroxy diphenyl ether being from about 0.15% to about 6%, and the proportion of said solvent being from about 0.15% to about 4%, basis of said transparent soap bar.

3,969,260

CORROSIVE INHIBITOR COMPOSITIONS

Herbert D. Clark, Burbank, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 3, 1974, Ser. No. 485,668

The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.

Int. Cl.[2] C11D *7/60;* **C23G** *1/04*

U.S. Cl. 252—147 **6 Claims**

1. The synergistic mixture of from about 30% to about 40% by weight of a lower alkynyl cycloalkanol, of from about 30% to about 40% by weight of an N,N'-dicycloalkyl-thiourea and from about 30% to about 40% by weight of polyaminomethylenephosphonate.

3,969,261

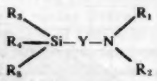
POROUS SUBSTANCES HAVING ION EXCHANGE PROPERTIES

Francois Meiller, Palaiseau, France, assignor to Rhone-Progil, Courbevoie, France

Filed July 10, 1974, Ser. No. 486,819
Claims priority, application France, July 13, 1973, 73.25698
Int. Cl.² C02B 1/40
U.S. Cl. 252—179 9 Claims

1. Porous substances having anionic ion exchanger properties consisting essentially of a porous mineral support, the surfaces of which have free hydroxyl groups, and at least one organo silicon compound grafted onto the porous mineral support by reaction with hydroxyl groups on the support, in which the organo silicon compound has an amine function in an organic group separated from the silicon atom by at least three carbon atoms and in which the porous substance has a specific surface area greater than 10 sq.m/g.

5. Process for the manufacture of porous substances according to claim 1, comprising in treating solid porous mineral supports possessing superficial hydroxyl groups with silanes having the general formula:



wherein at least one of the radicals R_3, R_4 and R_5 is an alkoxy radical and wherein Y is an organic group in which at least three atoms of carbon are present, the radicals R_1 and R_2 of the amine function being identical or different alkyls having from 1 to 3 carbon atoms.

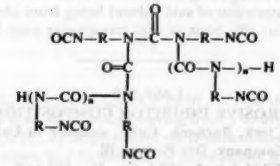
3,969,262

PROCESS FOR THE PRODUCTION OF SYNTHETIC PLASTICS COMPRISING URETHANE GROUPS AND BIURET GROUPS

Kuno Wagner, Leverkusen; Werner Dietrich, Cologne, both of Germany; Karl-Josef Kraft, Coraopolis, Pa., and Horst Conrad, Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 360,883, May 16, 1973, Pat. No. 3,899,454, which is a continuation-in-part of Ser. No. 264,641, June 20, 1972, abandoned, which is a continuation of Ser. No. 36,500, May 11, 1970, abandoned. This application Aug. 27, 1974, Ser. No. 501,015
Int. Cl.² C08G 18/72
U.S. Cl. 252—182 7 Claims

1. A polyisocyanate which comprises a solution in a monomeric polyisocyanate of from about 1 to about 85 percent of a biuret polyisocyanate having the formula:



in which

R is an aromatic, araliphatic or cycloaliphatic radical and wherein n is an integer of from 0 to 5 and the proportion of biuret-polyisocyanate having more than three isocyanate groups is at least 20 percent by weight based on the total quantity of biuret-polyisocyanates and the solution contains from about 0.3 to about 5 percent by weight based on the weight of the biuret polyisocyanate of an emulsifier chemically bound to the polyisocyanate, the biuret polyisocyanate being prepared in the presence of the emulsifier, said emulsifier being selected from the group consisting of hydroxyl containing oleyl alcohol polyglycol ether, castor oil polyglycol ether, isononyl phenol polyglycol ether, higher molecular weight n-dodecyl polyglycol ethers having a terminal OH group and the corresponding amine derivatives obtained by cyanoethylation and subsequent hydrogenation by the foregoing compounds.

3,969,263

METHOD OF PRODUCING LIGHT USING CATALYST CHEMILUMINESCENT SYSTEM

Herbert P. Richter; Carl A. Heller, both of China Lake, and Ruth E. Tedrick, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1975, Ser. No. 554,360
Int. Cl.² C01B 13/00
U.S. Cl. 252—186 3 Claims

1. In a method for producing light comprising bringing a hydrogen peroxide component containing a catalyst and an oxalate ester-fluorescent component together and allowing said components to react to produce said light, the improvement residing in utilizing, as said catalyst, a member selected from the group consisting of tetraalkylammonium trifluoroacetate wherein the alkyl groups contain from 1 to 4 carbon atoms, lithium trifluoroacetate and sodium trifluoroacetate.

3,969,264

CHOLESTERIC LIQUID CRYSTAL WATER BASE INK

Frederick Davis, Dublin, Calif., assignor to RPR, Inc., Dublin, Calif.

Filed Dec. 17, 1973, Ser. No. 425,006
Int. Cl.² G01K 11/16; C09K 3/34
U.S. Cl. 252—299 11 Claims

1. A composition useful in the formation of liquid crystal films which comprises:

a thick oil in water emulsion having from 30 to 80 weight percent solids of which 25–75 weight percent is a cholesteric liquid crystal composition and 75–25 weight percent respectively is a transparent latex film-forming polymer;

from 20–70 weight percent liquid, having water in from 40–75 weight percent and a moderately water soluble organic solvent having a boiling point less than about 150°C for said liquid crystal composition in from 25–60 weight percent; and

a small but sufficient amount of a thickening agent to provide the desired viscosity for film forming.

7. A method for forming a film-forming liquid crystal composition containing emulsion which comprises:

adding to a latex of a transparent film-forming polymer having from about 30–95 weight percent water, a solution of a cholesteric liquid crystal composition in a moderately water soluble organic solvent having a boiling point less than about 150°C, said solution having a sufficient amount of a thickening agent to provide a final concentration of from about 0.1 to 2 weight percent of the total composition, said liquid crystal composition being present in amount to provide from about 25–75 weight percent of the total solids content, wherein said solution is at a temperature in the range of about 40°–100°C, and stirring the resulting mixture for a time sufficient to provide a substantially uniform composition.

3,969,265

NOVEL LIQUID MEMBRANE FORMULATIONS AND USE THEREOF

Gopal H. Singhal, Westfield, N.J.; Martin L. Gorbaty, Baytown, Tex.; Richard M. Minday, North Plainfield, and Norman N. Li, Edison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 24, 1976, Ser. No. 482,592
Int. Cl.² C08D 7/00, 7/10
U.S. Cl. 252—309 15 Claims

1. A water-in-oil emulsion consisting of from 10 to 90 weight % of an exterior oil phase consisting of (a) a sulfonated polymer having a number average molecular weight of from about 1,000 to about 50,000, said sulfonated polymer comprising a substantially nonaromatic backbone and from 0.2 to 20 mole % sulfonic acid groups, the polymer being present at from 0.05 to 40 weight % based on weight solvent and (b) a solvent for said sulfonated polymer as the oil phase of the emulsion, said solvent being selected from the group consisting of petroleum distillates having a boiling point of greater than 200°C; paraffinic solvents bearing substituents selected from the group consisting of halogen, benzene and cycloalkyl rings; isoparaffins having an average carbon number of from about 10 to about 100 and combinations thereof and a reactive interior aqueous phase selected from the group consisting of aqueous acid and aqueous base, said reactive interior aqueous phase constituting the balance of the emulsion.

3,969,266

MICROPOROUS MEMBRANE PROCESS FOR MAKING CONCENTRATED SILICA SOLS

Ralph K. Iler, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 231,716, March 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 54,864, July 14, 1970, abandoned. This application July 2, 1973, Ser. No. 375,943
Claims priority, application Canada, June 23, 1971, 116479
Int. Cl.³ B01J 13/00
U.S. Cl. 252—313 S 6 Claims

1. A process for increasing the size of colloidal silica particles in an aqueous silica sol containing from 1 to 10% by weight silica consisting essentially of mixing with the sol at 80 to 100°C., a feed of sodium silicate solution and a solution of sulfuric acid, hydrochloric acid or carbon dioxide, the concentration of silica in the feed being below 0.6 times the weight ratio of SiO_2:Na_2O in the sodium silicate, the molar ratio of sodium silicate to sulfuric acid, hydrochloric acid or carbon dioxide in the feed being such to maintain the pH of the sol from 8 to 10 and the sodium salt concentration of the sol not above 0.2 normal and ultrafiltering the sol using a microporous membrane having pores smaller than the silica particles in the sol to remove sodium salt solution, while maintaining the concentration of sodium in the sol from N = 0.005 to N = 0.26-0.005C-0.002 (T-40) where N is the normality of the sodium in the sol, T is the temperature in degrees centigrade and C is the grams of silica per 100 milliliters of sol by the addition of water.

3,969,267

PROCESS FOR REDISPERSION OF NOBLE METAL CATALYSTS USING FLUORINE

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 11, 1974, Ser. No. 504,862
Int. Cl.³ B01J 23/96; C10G 35/08
U.S. Cl. 252—415 6 Claims

1. A method for regenerating a hydrocarbon conversion catalyst which comprises iridium supported on a refractory inorganic oxide support, and which is at least partially deactivated by the presence of carbonaceous deposits thereon which comprises, serially, the steps of

1. contacting said catalyst with an oxygen-containing gas at a temperature of at least 300°C: for a time sufficient to burn at least a substantial portion of said carbonaceous deposits from said catalyst and thereby converting at least a portion of said iridium into large particle size oxide crystallites;
2. contacting said catalyst with a reducing gas at an elevated temperature for a time sufficient to convert at least a portion of said iridium oxide into the metal;
3. contacting said catalyst with a gaseous dispersing agent comprising fluorine and an inert gas at a temperature of from between 25° and 250°C. for a time sufficient to redisperse said large crystallites to crystallites having a substantially smaller size to effect at least 43% redispersion but insufficient to volatize the iridium or to substantially reduce the surface area of the support.

3. The method of claim 1 wherein said support is alumina.

4. The method of claim 3 wherein said iridium containing catalyst additionally contains a metal selected from the group consisting of Groups IB, IV, VIIB and the noble and nonnoble metals of Group VIII of the Periodic Table of the Elements.

3,969,268

PROCESS FOR PREPARING ACTIVE CARBON FIBERS

Takashi Fukuda; Nobuo Ishizaki; Shoichi Iwahori, and Masayoshi Shimada, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Japan

Filed Dec. 31, 1974, Ser. No. 537,761
Int. Cl.² B01J 21/18
U.S. Cl. 252—423 23 Claims

1. A process for preparing active carbon fibers which comprises (a) providing a cellulose fiber with a phosphorus compound reactive thereto, (b) subjecting the resulting fiber to heat treatment at about 200° to 350°C until the decreased percentage of fiber becomes about 40 to 75 % (W/W) and then (c) subjecting the resultant fiber to activation treatment at about 450° to 1000°C in an atmosphere containing not less than about 5 % (V/V) of steam until the decreased percentage of fiber becomes about 65 to 95 % (W/W), the said phosphorous compound showing a residual percentage of phosphorus of not less than about 70 % (W/W) after the heat treatment of the step (b) and a residual percentage of phosphorus of not more than about 10 % (W/W) after the activation treatment of the step (c).

3,969,269

OLEFINE POLYMERIZATION CATALYST INCORPORATING AN ORGANO-PHOSPHORUS COMPOUND

Anthony David Caunt, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 268,505, July 3, 1972, abandoned. This application June 3, 1974, Ser. No. 475,840
Claims priority, application United Kingdom, July 13, 1971, 32856/71
Int. Cl.² C08F 4/52, 4/64, 4/68
U.S. Cl. 252—429 B 30 Claims

1. An olefine polymerisation catalyst consisting essentially of

1. one molecular proportion of a solid halide of titanium, vanadium or zirconium wherein the metal has a valency below its maximum,
2. between about 1.75 and about 4 molecular proportions of a Grignard reagent which is substantially ether free, $Mg[Al(C_6H_5)_4]_2$, $Mg(C_6H_5)_2$, a lithium aluminium tetraalkyl, an aluminium hydrocarbyl halide, an aluminium hydrocarbyl sulphate, an aluminium hydrocarbyl oxyhydrocarbyl, an aluminium trihydrocarbyl or a dihydrocarbyl aluminium hydride, and
3. up to C_A/f molecular proportions of a trivalent phosphorus compound of the formula $PR'_{3-a}(X\text{-}A\text{-}Y)_a$ wherein

R' is halogen, a hydrocarbyl group, the group $-NR_2$ or the group -OR;
X is -O-, -S- or -NR-;
A is a bivalent hydrocarbyl radical such that X and Y are separated by not more than 3 carbon atoms;
Y is -OR, -SR, $-NR_2$, $-PR_2$, a pyridyl radical, a quinolyl radical, an isoquinolyl radical, a furyl radical or a tetrahydrofuryl radical;
R is a hydrocarbyl group;
C_4 is the molecular proportion of component 2) and;
f is the number of functional groups in the phosphorus compound which contain O or N, there being at least one such functional group in the phosphorus compound N is 1, 2 or 3.

3,969,270

METHOD OF CATALYST MANUFACTURE

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,093
Int. Cl.² B01J *31/02, 31/12*
U.S. Cl. 252—430 13 Claims

1. A method of manufacturing a catalytic composite which comprises:

a. commingling a refractory inorganic oxide carrier material with an impregnating solution containing a Group VIII metal component and from about 0.05 to about 0.75 wt. % polybasic carboxylic acid, said polybasic carboxylic acid effecting subsurface impregnation of said Group VIII metal component;
b. maintaining carrier material in said solution for a period of time of from about 2 to about 10 minutes, thereafter commingling sufficient sulfur-containing carboxylic acid with said solution to provide from about 1 to about 3 mols of said acid per mole of said Group VIII metal, and effecting the deposition of said Group VIII metal component concentrated in a thin surface layer on said carrier material, said sulfur-containing carboxylic acid inhibiting substantial straying of said Group VIII metal from said subsurface layer;
c. prior to calcining impregnated carrier material, further impregnating the same with a solution of an alkaline earth metal salt of an organic acid selected from the group consisting of the calcium, strontium and barium salts thereof, and evaporating said solution to dryness in contact with the impregnated carrier material; and
d. thereafter calcining the impregnated carrier material in an oxidizing atmosphere at a temperature of from about 200° to about 1000°C. or more.

3,969,271

METHOD OF MANUFACTURING A CATALYTIC COMPOSITE USEFUL FOR THE TREATMENT OF GASEOUS WASTE PRODUCTS

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 16, 1974, Ser. No. 533,434
Int. Cl.² B01J *31/04, 31/12*
U.S. Cl. 252—430 11 Claims

1. A method of manufacturing a catalytic composite which comprises:

a. commingling a refractory inorganic oxide carrier material with an impregnating solution containing a sulfur-containing carboxylic acid and a Group VIII metal component in an acid/metal mole ratio of from about 1 to about 3, and effecting the deposition of said Group VIII metal compound on the outer surface of said carrier material;
b. prior to calcining the impregnated carrier material, further impregnating the same with a solution of an alkaline earth metal salt of an organic acid selected from the group consisting of the calcium, strontium and barium salts thereof, and evaporating said solution to dryness in contact with the impregnated carrier material; and
c. thereafter calcining the impregnated carrier material in an oxidizing atmosphere at a temperature of from about 200° to about 1000° C. or more.

3,969,272

CHROMIUM TRIS-DIORGANO-ORTHOPHOSPHATE-ALKYL ALUMINUM HALIDE CATALYSTS FOR OLEFIN POLYMERIZATION AND ALKYLATION OF AROMATIC COMPOUNDS

Jeffrey G. Meyer, Adrian, Mich., assignor to Anderson Development Company, Adrian, Mich.

Continuation-in-part of Ser. No. 319,621, Dec. 29, 1972, Pat. No. 3,907,849. This application Dec. 12, 1974, Ser. No. 532,010
Int. Cl.² B01J *31/14;* C08F *4/60*
U.S. Cl. 252—431 P 3 Claims

1. A combination catalyst composition for olefin polymerization and for alkylation of aromatic hydrocarbons with olefins, said catalyst consisting essentially of the reaction product prepared by mixing (A) a chromium tris-diorgano-orthophosphate of the formula $Cr[OP(O)(OR)_2]_3$ in which each R is selected from the class consisting of non-aromatic hydrocarbon groups free of aliphatic unsaturation and containing one to eight carbon atoms, non-aromatic hydrocarbon ether groups free of aliphatic unsaturation and containing three to six carbon atoms and chlorinated and brominated derivatives thereof, and (B) an alkyl aluminum halide of the general formula R'_cAlX_d in which each R' is an alkyl group of one to six carbon atoms, each X is a halogen atom, each of *c* and *d* is 1 or 2 and the total of *c* and *d* is 3, the mol ratio of (A) to (B) ranging from 1:1 to 1:20.

3,969,273

PROCESS FOR PREPARING PHOSPHATED ALUMINA EXTRUDATES

Stanley Monty Brown, Mount Airy, and David Nelson Wallace, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,178
Int. Cl.² B01J *27/16, 21/04, 23/84*
U.S. Cl. 252—435 7 Claims

1. A process for preparing extruded alumina catalyst supports containing 1 to 10% phosphate which consists essentially of the steps of:

a. precipitating the aluminum salt selected from the group consisting of aluminum sulfate, nitrate, and chloride with sodium or potassium aluminate within a pH range of 6.5 to 10.5, within a temperature range of 90° to 190°F. and with an alumina concentration in the precipitation slurry of from 1 to 8%,
b. washing the precipitate so as to remove contaminating cations and anions,
c. drying the washed hydrogel, and recovering an alumina powder,
d. adding a solution of water soluble phosphate containing compound, while mulling the alumina powder,
e. extruding, drying and calcining the mulled material.

3,969,274

FIXED BED CATALYST

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,259
Int. Cl.² B01J *29/16, 29/26, 29/00, 29/10*
U.S. Cl. 252—456 18 Claims

1. In a catalyst comprising an active catalytic material and a preformed support, wherein the active catalytic material is a metal, salt, oxide, acid, alloy, or heteropolyacid of an element of Groups I B, II B, IV B, V, VI B, VII B and VIII of the Periodic Table of Elements and mixtures thereof, the improvement which comprises employing as the support a regu-

lar or intermediate density silica xerogel which has been steam treated at a temperature up to 300° C.

3,969,275

METHOD FOR IMPREGNATING A WATER-SENSITIVE SOLID WITH A WATER-SOLUBLE MATERIAL USING AN AQUEOUS IMPREGNATING SOLUTION

Heinz P. Weber, Berkeley, and Gordon E. Langlois, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sept. 6, 1974, Ser. No. 503,983
Int. Cl.² B01J *29/06, 21/00, 23/08*
U.S. Cl. 252—455 R 11 Claims

1. A method for impregnating a water-sensitive solid with a water-soluble material, said solid containing micropores and comprising at least one metal oxide selected from the group consisting of oxides of metals of Groups II, III and IV of the Periodic Chart of the Atoms, and said micropores containing a substantially water-insoluble gas, which comprises:

1. replacing the water-insoluble gas in said micropores with a hydrophylic gas selected from the group consisting of steam, substantially water-soluble gases and mixtures thereof by stripping said solid with said hydrophylic gas under gas-stripping conditions; and
2. impregnating said solid by immersing the stripped solid in an aqueous solution of said material, said impregnating being effected while maintaining substantial absence of water-insoluble gas from the micropores of said solid.

5. A method as in claim 1 wherein said oxide consists essentially of alumina and contains at least one oxide of the group consisting of magnesia, silica, boria and titania.

3,969,276

METHOD OF MANUFACTURING A ZEOLITIC ADSORBENT

Donald H. Rosback, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 356,666, May 2, 1973, Pat. No. 3,878,127. This application Mar. 19, 1975, Ser. No. 560,279
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 Z 13 Claims

1. A method of manufacturing a solid adsorbent which method comprises the steps of:

a. contacting a base material comprising X or Y zeolite with an aqueous sodium hydroxide solution at first ion exchange conditions to effect the addition of sodium cations to said base material;
b. treating the sodium-exchanged base material at second ion exchange conditions to effect the essentially complete exchange of sodium cations with one or more cations selected from the group consisting of Group IA, Group IIA, and Group IB of the Periodic Table of Elements; and,
c. drying the material at conditions to reduce the LOI at 900° C. to less than about 10 weight percent.

3,969,277

CATALYST FOR HYDROCARBON CONVERSION

Emmanuel E. Neel, Grand-Quevilly, and Gerard F. Joachimsmann, Rouen, both of France, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1975, Ser. No. 543,739
Claims priority, application France, Feb. 13, 1974, 74.04834
Int. Cl.² B01J *29/06*; C10G *13/02*
U.S. Cl. 252—455 Z 7 Claims

1. A process for the preparation of a tungsten-containing catalyst suitable for the conversion of hydrocarbons, which comprises contacting particulate erionite with a non-aqueous solution of at least one tungsten salt to exchange tungsten into the erionite, washing the product to remove non-exchanged tungsten, drying the product, mixing the tungsten-exchanged erionite with carbon powder having an average particle size of 0.2 mm or less in diameter, shaping the mixture and removing the carbon by burning.

3,969,278

METALLOCERAMIC CURRENT-CONDUCTING MATERIAL AND A METHOD FOR PREPARING SAME

Yakov Dmitrievich Aksenov, pereulok Klumova, II, kv. 31; Georgy Alexandrovich Gumansky, ulitsa Daniily Serdicha, 72, kv. 6; Valery Mikhailovich Drako, ul. Zm. Byaduli, 6, kv. 54, and Nikolai Konstantinovich Fedoseenko, ulitsa Narodnaya, 22, kv. 44, all of Minsk, U.S.S.R.

Continuation-in-part of Ser. No. 455,037, March 26, 1974, abandoned, which is a continuation of Ser. No. 275,958, July 28, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,266
Int. Cl.² H01B *1/02*
U.S. Cl. 252—513 3 Claims

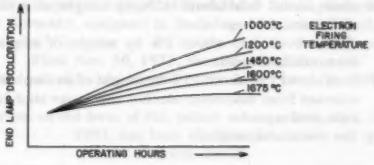
1. A sintered metalloceramic current-conducting material consisting essentially of 60–80 percent by weight of a nickel-chromium alloy as a current-conducting component, 17–35 percent by weight of fully oxidized aluminum as an insulating component which serves as a refractory filler material, and 3–5 percent by weight of a mixture of oxides of nickel and chromium, the mixture of oxides of nickel and chromium coating the particles of the nickel-chromium alloy which serves to separate the particles of the nickel-chromium alloy and to increase the specific resistance of the material.

3,969,279

METHOD OF TREATING ELECTRON EMISSIVE CATHODES

Edmund R. Kern, Hampton, N.H., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 13, 1974, Ser. No. 497,026
Int. Cl.² H01B *1/08*
U.S. Cl. 252—521 4 Claims



1. A method of treating electron emissive barium tantalate coatings in order to improve the electron emissive properties over the operational life of the coatings comprising the following steps:

placing the coating in an oxygen free environment;
heating the coating to at least 1200°C for one to ten minutes to remove excess free barium from the tantalate; and
cooling the coating within the oxygen free environment.

3,969,280

SOLID AIR FRESHENER GELS

John G. Sayce, Headly, and David J. Brown, Sandhurst, Camberley, both of England, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Apr. 3, 1975, Ser. No. 564,970
Claims priority, application United Kingdom, Mar. 7, 1975, 9616/75
Int. Cl.² A61L *9/00*
U.S. Cl. 252—522 10 Claims

1. An air freshener gel composition consisting essentially of in an aqueous system from 0.5–10% by weight of carboxy-

methyl cellulose selected from sodium carboxymethyl cellulose and potassium carboxymethyl cellulose; from 0.01–10% by weight of perfume; from 0.05–10% of a surfactant; a source of trivalent cations selected from chromic ions, aluminum ions and mixtures sufficient to produce a weight ratio of carboxymethyl cellulose to effective weight of trivalent cation of 1:0.01 to 1:0.1 and water to 100%.

3,969,281

WATER-SOLUBLE IMIDAZOLINE COMPOSITION FOR REMOVING IRON SULFIDE AND SLUDGE FROM METAL SURFACES

Thomas L. Sharp, 715 Nenana St., Houston, Tex. 77035

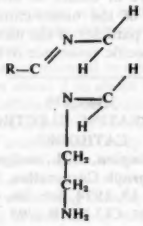
Filed Sept. 23, 1974, Ser. No. 508,655
Int. Cl.² C11D *1/62, 1/835, 3/30*
U.S. Cl. 252—542 **6 Claims**

1. A water soluble composition effective for the removal of iron sulfide and sludge from interior metal surfaces comprising:

a. from about 2 to about 15% by weight of a high molecular weight diamine;

b. from about 2.5 to about 18% by weight of acetic acid;

c. from about 1 to about 10% by weight of an organic nitrogen substituted imidazoline of the formula



wherein R is an alkyl radical

d. from about 6 to about 15% by weight of a non-ionic surfactant; and

e. from about 2 to about 8% by weight of a quaternary ammonium chloride.

f. from about 1 to about 15% by weight of an alcohol solvent selected from diacetone alcohol and lower aliphatic alcohols; and

g. the remainder, water.

3,969,282

ACIDIC SURFACTANT COMPOSITION, STOCK SURFACTANT SOLUTION PREPARED THEREFROM, AND METHOD OF WASHING SOILED SUBSTRATES EMPLOYING THE SAME

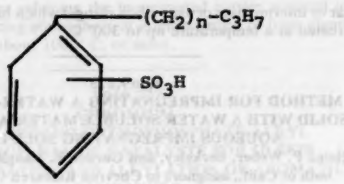
Frank R. Kappler, Wyandotte; John D. Ciko, Allen Park, and John J. Cramer, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1974, Ser. No. 535,260
Int. Cl.² C11D *1/22, 1/831*
U.S. Cl. 252—559 **41 Claims**

1. An acidic stable homogeneous mobile liquid biodegradable surfactant composition consisting essentially of

1. at least one liquid hydrophilic nonionic surfactant, the said nonionic surfactant being a polyoxyalkylene adduct of a hydrophobic base wherein the oxygen/carbon atom ratio in the oxyalkylene portion of the molecule is greater than 0.40 and the said oxyalkylene portion constitutes at least 60% by weight of the said molecule,

2. at least one substantially salt free liquid biodegradable alkyl benzene sulfonic acid surfactant corresponding to the structural formula:



wherein *n* is an integer having a numerical value of from 3 to 14,

3. about 0.0001–1% by weight of hydrogen peroxide, and

4. about 0–95% by weight of water,

the liquid surfactant composition containing a weight ratio of surfactant (1) to surfactant (2) from 1:5 to 5:1, the surfactant (1) having hydrophilic properties whereby the liquid surfactant composition is stable and remains homogeneous in the absence of an added hydrotrope, and the hydrogen peroxide being present in an amount to control obnoxious odors.

35. In a method of washing soiled textile materials wherein textile material having an undersirable foreign substance thereon is agitated in an aqueous medium containing a surfactant under conditions whereby at least a portion of the foreign substance is removed, the improvement which comprises washing the said soiled textile material in an alkaline aqueous medium containing (A) a surfactant composition in accordance with claim **1**, and (B) a water soluble alkaline substance which provides in solution at least one ion selected from the group consisting of ammonium ion, sodium ion, and potassium ion in an amount whereby the said alkyl benzene sulfonic acid surfactant of (A) is converted to the corresponding salt.

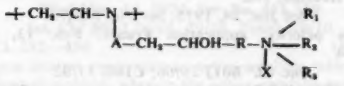
3,969,283

RECORDING MATERIAL

Daniel Maurice Timmerman, Mortsel, and Walter Frans De Winter, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

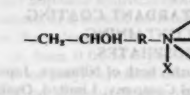
Division of Ser. No. 323,420, Jan. 15, 1973, Pat. No. 3,864,158. This application Jan. 3, 1975, Ser. No. 538,262
Claims priority, application United Kingdom, Jan. 17, 1972, 2134/72
Int. Cl.² C08G *73/00*
U.S. Cl. 260—2 EN **1 Claim**

1. Electroconductive polymers comprising recurring units corresponding to the general formula:



wherein:

A represents a single chemical bond or a group of the formula $-CH_2-CH_2-NR_4-$, wherein R_4 represents hydrogen or a group of the formula:



wherein:

R represents a branched or unbranched alkylene group having up to 4 carbon atoms,

each of R_1, R_2, and R_3 (same or different) represents an alkyl group containing up to 4 carbon atoms, a cycloalkyl group or an aralkyl group,

or wherein R_1, R_2, and R_3 together with the nitrogen atom represent a heterocyclic amine group, and

X is an anion.

3,969,284

AMINO ACID DERIVATIVES OF CHLOROMETHYLATED POLYMERS AND METHODS OF MAKING THE SAME

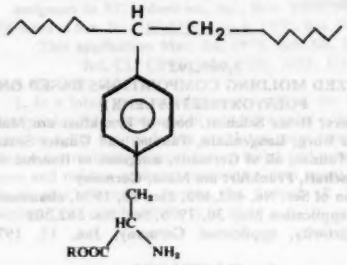
Don N. Gray, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 24, 1973, Ser. No. 363,677

Int. Cl.² C08F *8/00, 8/32*

U.S. Cl. 260—2.1 E **5 Claims**

1. A resinous polymer consisting essentially of recurring units in its molecular formula as follows:



where R is H or a metal that is the residue of the reaction of a base with a carboxyl group to form the acid salt.

3,969,285

HEAT-TREATED FLUOROCARBON SULFONYLAMINE CATION PERMSELECTIVITY

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1973, Ser. No. 425,079

Int. Cl.² C08J *5/22*

U.S. Cl. 260—2.2 R **5 Claims**

1. A film of a fluorinated ion exchange polymer comprising

a. a first surface formed from an intermediate fluorinated polymer containing pendant sulfonyl halide groups attached to carbon atoms which have at least one fluorine atom connected thereto in which at least 40% of the sulfonyl halide groups to a depth of at least one micron in the intermediate polymer have been reacted with a di- or poly-amine comprising at least two groups with one primary amine group and a second amino group either primary or secondary; and

ii. the polymer of (i) has been subjected to an elevated temperature of between 170°C. and the degradation temperature of the reacted polymer for a period of time to increase permselectivity;

b. a second surface containing pendant sulfonyl groups attached to carbon atoms which have at least one fluorine atom connected thereto with at least a majority of the sulfonyl groups present as $-(SO_2NH)_mQ$, or $-(SO_3)_nMe$ wherein Q is selected from the group consisting of H, NH_4, cation of an alkali metal, cation of an alkaline earth metal and combinations thereof, m is the valence of Q, Me is a cation and n the valence of the cation.

3,969,286

EPOXY RESIN

Glenn R. Wilson; Ival O. Salyer, both of Dayton, and George L. Ball, III, West Carrollton, all of Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 24, 1972, Ser. No. 237,872

Int. Cl.² C08J *9/30*

U.S. Cl. 260—2.5 EP **3 Claims**

1. A process for preparing a gas frothable epoxy foam that can be troweled and that cures a near room temperature which comprises the steps of:

a. preparing an amine terminated prepolymer by mixing a polyamine with a polyepoxide in at least a 2 to 1 mole ratio;

b. contacting the prepolymer with about 2 to about 10 weight percent of a fatty acid containing from about 8 to about 32 carbon atoms to form a curing agent;

c. mixing from about 20 to about 50 parts by weight of the curing agent with 100 parts by weight of an organic epoxide, the uncured mixture having a viscosity of at least 5,000 centistokes; and

d. foaming the uncured mixture by incorporating a gas comprising elemental nitrogen into the mixture.

3,969,287

CARRIER-BOUND PROTEIN PREPARED BY REACTING THE PROTEIN WITH AN ACYLATING OR ALKYLATING COMPOUND HAVING A CARRIER-BONDING GROUP AND REACTING THE PRODUCT WITH A CARRIER

Dieter Jaworek, Weilheim, Upper Bavaria; Michael Nelböck-Hochstetter, Tutzing; Klaus Beaucamp, Tutzing; Hans Ulrich Bergmeyer, Tutzing, and Karl-Heinz Botsch, Bernried, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Nov. 30, 1973, Ser. No. 420,510

Claims priority, application Germany, Dec. 8, 1972, 2260185

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² C08L *89/00*

U.S. Cl. 260—8 **17 Claims**

1. Process for the preparation of a carrier-bound protein, which process comprises reacting a protein in aqueous solution with a compound containing at least one group capable of acylating or alkylating proteins, said group being selected from the class consisting of an ethyleneimine group, a halide group activated by unsaturation, an acid-halide group, an azide group, an acid anhydride group, an aldehyde group, and an oxazolone group; and at least one additional group capable of producing a bond with a carrier material, and reacting the reducing product with a carrier material.

3,969,288

CARBODIIMIDE-ISOCYANURATE FOAMS PREPARED FROM ACID-MODIFIED TOLUENE DIISOCYANATE

Moses Cenker, Trenton, and Peter T. Kan, Plymouth, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 2, 1974, Ser. No. 511,112

Int. Cl.² C08G *18/02, 18/12, 18/14*

U.S. Cl. 260—2.5 BF **8 Claims**

1. In a process for the preparation of a rigid cellular foam characterized by carbodiimide linkages wherein an organic

polyisocyanate is catalytically condensed in the presence of a catalytically sufficient amount of a carbodiimide catalyst, the improvement which comprises:

employing as the organic polyisocyanate commercial pure toluene diisocyanate which has been acid-modified by adding an excess amount of a conventional acidifying agent to achieve an acidity level of a minimum of about ten times the acidity level of the commercial pure toluene diisocyanate.

2. The process of claim 1 wherein the toluene diisocyanate is employed as an isocyanate-terminated quasi-prepolymer to prepare therefrom a urethane-modified rigid cellular foam characterized by carbodiimide linkages.

3,969,289

ONE-PART FOAMABLE LATEX COMPOSITION

Perley A. Coffin, Gloucester; Philip G. Cook, Newton, and Paul D. Demerjian, Andover, all of Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

Filed Mar. 15, 1971, Ser. No. 124,514

Int. Cl.² C08J 9/30; C08K 5/16; C08L 7/02, 9/08

U.S. Cl. 260—2.5 L 27 Claims

1. A one-part foamable latex composition which may be stored for extended periods of time prior to foaming, which foamable latex composition comprises:

a. a natural or synthetic elastomeric latex subject to cure;

b. a curing system which comprises an ammonia-retardant dibenzyl dithiocarbamate accelerating agent, which agent is inhibited in accelerating function in the presence of the base;

c. a volatile nitrogen-containing base in an amount sufficient to inhibit the cure of the latex;

d. a siloxane heat-sensitizing agent to lower the coagulation temperature of the latex to about 90°F or above; and

e. a foaming agent in an amount to permit mechanical frothing of the composition into a foam.

3,969,290

N,N'-SUBSTITUTED 2,4,5-TRIKETOIMIDAZOLIDINES

Kurt Kraft, Auringen; Johannes Reese, Wiesbaden-Biebrich, and Gerd Walz, Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jan. 23, 1974, Ser. No. 435,885

Claims priority, application Germany, Jan. 24, 1973, 2303239

Int. Cl.² C08G 18/14, 18/06, 18/10

U.S. Cl. 260—2.5 N 19 Claims

1. A process for the preparation of modified N,N'-substituted-2,4,5-triketoimidazolidine which comprises reacting a precondensate having terminal isocyanate groups with at least one oxamidic ester to form a product having polymerizable groups wherein the precondensate is first prepared by reacting (a) a polybasic carboxylic acid, containing from 4 to 70 carbon atoms and from 2 to 6 caboxyl groups, with an excess of (b) one or more isocyanates or isocyanate forming compounds in the presence of a solvent, said oxamidic ester containing the group NH—CO—CO—OR^V wherein R^V represents an aliphatic hydrocarbon group containing up to 18 carbon atoms, a cycloaliphatic hydrocarbon group containing up to 8 carbon atoms or a mononuclear aromatic hydrocarbon group being unsubstituted or substituted by at least one hydrocarbon group and having a total of up to 14 carbon atoms and said reaction between the precondensate and oxamidic ester taking place in the presence of a solvent.

3,969,291

INTUMESCENT FIRE-RETARDANT COATING COMPOSITIONS CONTAINING AMIDE-POLYPHOSPHATES

Kozo Fukuba, and Yasutomo Ogushi, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 6, 1975, Ser. No. 555,907

Claims priority, application Japan, Mar. 6, 1974, 49-26574; June 17, 1974, 49-69331

Int. Cl.² C08L 3/02

U.S. Cl. 260—17.3 13 Claims

1. An intumescent fire-retardant coating composition comprising an aqueous dispersion of (A) a substantially water-insoluble amide polyphosphate condensate comprising the heat-condensation product of a phosphoric acid-containing material selected from the group consisting of ammonium orthophosphate, orthophosphoric acid, polyphosphoric acid, phosphoric anhydride, urea phosphate and mixtures thereof with a cyanamide derivative selected from the group consisting of melamine, dicyanamide or mixtures thereof, as nitrogen source in the presence of a condensing agent selected from the group consisting of urea, urea phosphate and a mixture thereof in a molar ratio of 0.8:1:0.05 to 1.5:1:1 of urea : phosphoric acid-containing material (as H_3PO_4) : cyanamide derivative at a temperature of from about 150° to 350°C, (B) a film forming binder comprising a polymer solution in an organic solvent or an aqueous emulsified polymer solution, and (C) a carbonific material selected from the group consisting of a saccharide and a polyhydric alcohol, with (A), (B) and (C) comprising from about 20 to 90% by weight of the total composition.

3,969,292

STABILIZED MOLDING COMPOSITIONS BASED ON POLY(OXYMETHYLENE)

Ernst Wolters; Heinz Schmidt, both of Frankfurt am Main; Karlheinz Burg, Langenhain, Taunus, and Günter Sextro, Naurod, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 432,405, Jan. 10, 1974, abandoned. This application May 30, 1975, Ser. No. 582,301

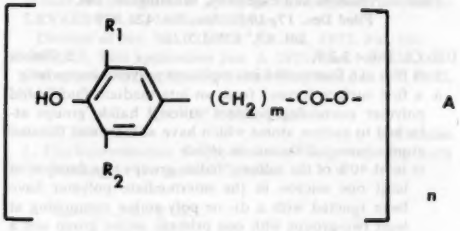
Claims priority, application Germany, Jan. 12, 1973, 2301351

Int. Cl.² C08J 3/20

U.S. Cl. 260—18 EP 9 Claims

1. A stabilized molding composition based on poly(oxymethylene) containing

a. from 0.05 to 4 per cent by weight, calculated on the poly(oxymethylene), of a compound of the formula

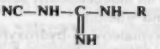


in which R_1 represents an alkyl radical having from 1 to 6 carbon atoms, R_2 stands for a hydrogen atoms or an alkyl radical having from 1 to 6 carbon atoms, A is a bi- to hexava-

lent aliphatic hydrocarbon radical having from 1 to 12 carbon atoms, m is zero or an integer of from 1 to 6 and n corresponds to the valence of A,

b. from 0.01 to 3 per cent by weight, based on the weight of poly(oxymethylene), of an alkaline earth metal salt of an aliphatic hydroxycarboxylic acid having from 2 to 9 carbon atoms, and

c. 0.01 to 1 per cent by weight, calculated on the poly(oxymethylene), of a compound of the formula



in which R represents a hydrogen atom, a cyano group, an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 6 to 12 carbon atoms, or an aryl radical having from 6 to 12 carbon atoms, and in which the alkyl, cycloalkyl or aryl radical may be substituted by 1 to 3 hydroxyl groups.

3,969,293

BASIC ZINC PHOSPHITES

Edward Louis White, Freehold; William Ernest Robertson, Trenton, and William Heng-Sen Yu, Hightstown, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 385,850, Aug. 6, 1973, Pat. No. 3,917,804. This application Mar. 24, 1975, Ser. No. 561,276

Int. Cl.[2] C09D *3/66, 3/80, 5/02, 5/14*

U.S. Cl. 260—22 CB **3 Claims**

1. In a latex paint coating composition, the improvement comprising having present in said latex paint coating composition an agent for rendering said latex paint coating composition color resistant toward tannin stains and possessing corrosion and mildew resistant properties, said agent comprising a basic zinc phosphite having the formula X $ZnO.ZnHPO_3$ where X is a number from ½ to 10.

3,969,294

SEGMENTED COPOLYESTER ADHESIVES STABILIZED BY ALKALINE EARTH OXIDES AND CARBOXYLIC COMPOUNDS

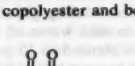
Lucien Marc Papouchado, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 26, 1975, Ser. No. 553,078

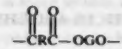
Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—26 **41 Claims**

1. A thermally stabilized thermoplastic hot melt adhesive composition which comprises, based on the total thermoplastic components, (A) 1 to 99 percent by weight of thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula



and said long chain ester units amount to 25 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent radical taken from the group consisting of cyclic, aromatic or aliphatic radicals remaining after removal of the carboxyl groups from a cyclic, aromatic or aliphatic dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150 and a melting point of at least 90°C.; (B) 1 to 99 percent by weight of low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150°C., and has a melt viscosity of less than 10,000 centipoises at 200°C.; stabilized with (C) 5.0 to 30 percent by weight, based on the weight of elastomer and resin, of an alkaline earth oxide taken from the group consisting of beryllium, magnesium, calcium, strontium and barium oxide, in combination with (D) 0.05 to 5.0 percent by weight, based on the weight of elastomer and resin, of a carboxylic compound, taken from the group consisting of an aromatic compound having at least two carboxylic acid groups, an aliphatic compound having at least two carboxylic acid groups and anhydrides thereof, said carboxylic compound, when unsubstituted, containing up to 17 carbon atoms inclusive of said carboxylic acid groups.

3,969,295

AQUEOUS LATEX MATERIAL TO BE USED FOR PRODUCTION OF REINFORCED PLASTICS AND BINDERS AND METHOD FOR PRODUCING THE SAME

Olof Sundén, Lidingo, and Hans Erik Johansson, Kungalv, both of Sweden, assignors to Elektrokemiska Aktiebolaget, Surte, Sweden

Filed Dec. 6, 1974, Ser. No. 530,504

Claims priority, application Sweden, Dec. 21, 1973, 7317389

Int. Cl.[2] C08L *23/08*

U.S. Cl. 260—29.6 S **8 Claims**

1. A process for producing an aqueous latex material used in the production of reinforced plastics and binders, comprising the steps of

a. preparing an aqueous solution of monomeric and/or oligomeric silicic acid by rapid neutralization and acidification of an alkali silicate solution to a final pH below 4 by adding silicate solution to a strong acid or to a suspension of a strong, acidified cationic ion exchanger,

b. preparing an aqueous latex of a film-forming organic polymer, said latex (1)containing particles of a polymer which is film-forming at the temperatures used for drying the final product, (2) containing groups having hydrogen bonding power, and (3) being based on an emulsification system resistant to acidic conditions,

c. adding the aqueous solution of the monomeric and/or oligomeric silicic acid prepared in (a) to the aqueous latex prepared in (b) while maintaining a pH below 6 thereby to effect an encapsulation of the silicic acid on the surface of the organic polymer particles and a reversible agglomeration of the encapsulated particles, the components prepared in (a) and (b) being mixed in such proportions that between 0.5 and 50% silicic acid will be encapsulated around the latex particles, calculated as SiO_2 based on the weight of the organic polymer, and

d. adding alkali to the encapsulated and agglomerated latex up to a pH of 8 to 12 in aqueous phase, thereby to induce a negative ionic charge on the outer surface of the acidic silicic acid encapsulation layer and to cause re-emulsification.

3,969,296

VINYL ESTER COPOLYMER LATICES AND THEIR PREPARATION

Teunis C. Wassenburg, and William J. Van Westrenen, both of Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 18, 1975, Ser. No. 550,483

Claims priority, application United Kingdom, Mar. 1, 1974, 9328/74

Int. Cl.² C08L *27/06*

U.S. Cl. 260—29.6 TA 6 Claims

1. A process for the preparation of vinyl ester latices having improved scrub resistance which comprises first copolymerizing in an aqueous emulsion medium a composition comprising

1. from 10 to 50% of a vinyl ester of a saturated aliphatic alpha-branched monocarboxylic acid with
2. from 0.5 to 5.0% of a glycidyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid having from 3 to 4 carbon atoms,
3. from 49.5 to 89.5% of vinyl acetate or vinyl chloride,
4. from 0.5 to 5.0% of an alphatic alpha, beta-ethylenically unsaturated carboxylic acid having 3 to 4 carbon atoms or a partial ester thereof, and then reacting at from 60° to 90°C the resulting copolymer with ammonia in an amount sufficient to convert at least 50% of the glycidyl groups into hydroxyaminopropyl groups, said percentages being by weight based on total monomers.

3,969,297

CLEAR ETHYLENE POLYMER EMULSIONS HAVING PARTICLE SIZE LESS THAN 100 ANGSTROM UNITS AND POLISHES CONTAINING THE SAME

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 14, 1975, Ser. No. 540,848

Int. Cl.² C08F *110/02*

U.S. Cl. 260—29.6 XA 17 Claims

10. In a clear liquid polish composition which has a light transmission of at least about 60 percent and which contains an aqueous dispersion of resin particles and other additives including those selected from leveling agents, plasticizers, and fluxes, the improvement comprising:

a clear latex component admixed therein which latex has a light transmission of at least about 95% and comprises emulsion polymerized polymer particles selected from polymers and copolymers of ethylene which have an average size no larger than about 100 angstrom units, said polymer particles being formed by polymerizing ethylene under a greater than atmospheric pressure by contacting gaseous ethylene with an aqueous medium maintained at an elevated temperature in the range of from about 70°C to about 150°C, said medium containing a water soluble salt of persulfuric acid as initiator in an amount effective to initiate polymerization, from about 2 to about 5 percent by weight of said aqueous medium of an anionic emulsifier, and from about 0.3 to about 0.7 percent by weight of said aqueous medium of an alkyl mercaptan having from about 4 to about 20 carbon atoms.

3,969,298

SELECTED LIPOPHILIC AMINIMIDES AND POLYMERS DERIVED THEREFROM USEFUL FOR MAKING STABLE EMULSIONS

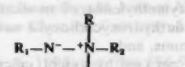
Robert C. Gasman, Schaumberg, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 381,932, Aug. 24, 1973, which is a division of Ser. No. 120,331, March 2, 1971. This application Nov. 8, 1974, Ser. No. 522,071

Int. Cl.² C08F *3/90*

U.S. Cl. 260—29.6 HN 6 Claims

1. A process for stabilizing the polymerization of ethylenically-unsaturated monomers which comprises copolymerizing in an aqueous medium with a free-radical inorganic or organic percompound catalyst at least one compound having the formula

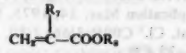


A.

wherein each R is an independently selected alkyl having 1 to 3 carbon atoms and wherein

a. R_1 is 4-hydroxymaleoyl, 4-hydroxyfumaroyl, 4-hydroxycitraconoyl or 4-hydroxyitaconoyl and R_2 is a lipophilic radical comprising an aliphatic hydrocarbon chain having about 10 to about 28 carbon atoms; or

b. R_1 is a lipopholic radical comprising an aliphatic hydrocarbon chain covalently linked to the nitrogen through an hydroxysuccinyl linkage and R_2 is -A-V wherein A is ethylene, propylene, isopropylene, 2-hydroxypropylene, acetoxypropylene or $-O-CH_2-CHR_6-(O-CH_2-CHR_6)_n-$ where R_6 is hydrogen or methyl and n is zero to 4, and V is acryloyloxy, methacryloyloxy, acrylamido, methacrylamido, vinyloxy, allyloxy, methallyloxy, vinylacetoxy, allylacetoxy, methallyloacetoxy, allyl, methallyl, 4-hydroxymaleoyloxy, 4-hydroxyfumaroyloxy, 4-hydroxycitraconoyloxy, or 4-hydroxyitaconoyloxy; with the proviso that A is zero where V is vinylacetoxy, allylacetoxy, methallylacetoxy, allyl or methally, with at least one ethylenically-unsaturated monomer selected from the group consisting of vinyl chloride, vinyl acetate, acrylonitrile and acrylic esters having the formula



B.

wherein R_7 is hydrogen or methyl and R_8 is C_1 to C_{18} alkyl.

3,969,299

SIZING OF GLASS FIBERS USING AQUEOUS DISPERSIONS OF FILM-FORMING COPOLYMER OF 90 PERCENT BY WEIGHT VINYL ACETATE WITH QUATERNARY AMMONIUM SALT DERIVATIVE OF ACRYLIC ACID COMONOMER

Robert Burns, Bramhall, and Alan Edward Johnson, St. Helens, both of England, assignors to Fibreglass Limited, England

Filed July 13, 1972, Ser. No. 271,238

Claims priority, application United Kingdom, July 15, 1971, 33349/71

Int. Cl.² C08L *33/10, 31/04*

U.S. Cl. 260—29.6 HN 3 Claims

1. An aqueous size composition for coating glass fibres comprising water, and a dispersion in said water of a film forming agent consisting essentially of about 5 to 15 percent by weight of a copolymer of at least 90 percent by weight vinyl acetate units wherein the comonomer units of said copolymer are cationic units and are a quaternary ammonium salt derivative of acrylic acid, and about 0.05 to 1 percent by weight of a silane lubricant.

3,969,300

WATER-SOLUBLE COATING MATERIALS

Nobuyoshi Nagata, Nara, and Ryuzo Mizuguchi, Osaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 182,563, Sept. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 732,556, May 28, 1968, abandoned. This application Sept. 24, 1973, Ser. No. 399,884

Int. Cl.² C08L 61/20

U.S. Cl. 260—29.4 UA 39 Claims

1. In a coating material comprising water, a water-soluble, organic solvent and a water-soluble, thermosetting resin as substantial, film-forming component, said resin being a mixture of (A) 4 to 50 parts by weight of a water-soluble amino resin and (B) a water-soluble salt of 100 parts by weight of a copolymer with 0.5 to 2.0 equivalents of an amine with respect to carboxyl groups in said copolymer, the improvement wherein said copolymer comprises:

1. 50 to 80.5 parts by weight of at least one hydroxy-free, polymerizable, unsaturated monomer having 2 to 30 carbon atoms, and
2. a total of 19.5 to 50 parts by weight of an α,β-ethylenically unsaturated carboxylic acid having 3 to 5 carbon atoms and a polyglycidyl polyether of a dihydric phenol, said polyglycidyl polyether having at least two epoxy group, the proportion of said polyglycidyl polyether being 0.01 to 0.5 equivalent with respect to the carboxyl group contained in said α,β-ethylenically unsaturated carboxylic acid, said α,β-ethylenically unsaturated carboxylic acid having been reacted with at least 10 % of the epoxy groups of the polyglycidyl polyether.

3,969,301

POLYTETRAMETHYLENEETHER POLYURETHANE ADHESIVE COMPOSITION

Robert Dean Thurn, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 182,913, Sept. 20, 1971, abandoned. This application June 30, 1972, Ser. No. 268,046

Int. Cl.² C08G 18/66

U.S. Cl. 260—30.4 N 12 Claims

1. A polyurethane composition which consists essentially of reaction product of (a) 4,4'-methylenebis(phenyl isocyanate), (b) tolylene diisocyanate, (c) 1,4-butanediol, and (d) polytetramethyleneether glycol having a number average molecular weight of about 900–2100; the mole ratio of (a) to (b) being about 1.2/1 to 2.5/1, the mole ratio of (c) to (d) being such that the average molecular weight of a mixture of (c) and (d) is about 450–850, and the mole ratio of (a) plus (b) to (c) plus (d) being about 1/1.015 to about 1/1.050.

3,969,302

PROCESS FOR THE DYEING OF COLORED SHAPED ARTICLES OF HIGH POLYMER, SYNTHETIC RESINS AND PREPARATIONS FOR SUCH PROCESS

Jacques Wegmann, Bettingen; Carl Becker, Basel; Guenther Zwahlen, Dornach, and Werner Kuster, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 348,383, April 5, 1974, Pat. No. 3,923,452, which is a continuation-in-part of Ser. No. 94,947, Dec. 3, 1970, abandoned. This application Sept. 26, 1974, Ser. No. 509,617

Claims priority, application Switzerland, Dec. 3, 1969, 18045/69; Jan. 8, 1970, 156/70; Jan. 30, 1970, 1297/70

Int. Cl.² C08K 5/15

U.S. Cl. 260—30.4 R 30 Claims

1. A process for the manufacture of a colored or optically brightened shaped article of high polymer synthetic resin, comprising the steps of treating granules of water-insoluble, hydrophobic, high polymer, synthetic, thermoplastic resin with a non-emulsified two-phase mixture of a hydrophilic solvent and a lesser amount of an organophilic solvent containing a dispersed or dissolved dyestuff or optical brightener which is more soluble in the organophilic solvent than in the hydrophilic solvent, wherein the hydrophilic solvent and the organophilic solvent are soluble in each other to the extent of at least 0.1%, wherein the organophilic solvent is present to the extent of about 3% to about 1300% by weight of the resin, wherein the mixture of the hydrophilic and organophilic solvents do not dissolve or swell the resin granules, and wherein the treatment is carried out until the organophilic solvent phase and dyestuff or optical brightener is uniformly distributed on the surface of the resin granules, and finally removing the solvents and drying the treated resin granules.

3,969,303

LINING MATERIAL FOR ACRYLIC DENTURES AND METHOD OF PREPARING THE SAME

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Continuation-in-part of Ser. No. 203,423, Nov. 30, 1971, abandoned. This application Aug. 28, 1974, Ser. No. 501,148

Int. Cl.² A61C 13/22; C08K 5/12; C08L 31/02

U.S. Cl. 260—31.8 C 3 Claims

1. A liner material for polymerized methylmethacrylate denture restorations consisting essentially of an admixture of approximately 40% of finely powdered methylmethacrylate polymer, approximately 10% of methylmethacrylate monomer, and approximately 50% of butyl phthalyl butyl glycolate, which has been semi-cured for approximately 15 minutes at a temperature of about 160°F. into a somewhat hard material, capable of being softened by application of heat and pressure and finally cured at approximately 212°F. with a denture to adhere thereto and to provide a soft liner therefor.

3,969,304

ETHYLENE POLYMER FILMS

Donald W. Pugh, Milford, and James W. Biggs, Lebanon, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,783

Int. Cl.² C08K 5/20

U.S. Cl. 260—32.6 PQ 16 Claims

1. A composition comprising (a) a film grade ethylene polymer; (b) about 0.01–0.5 weight percent of N,N'-ethylene bis erucamide; (c) about 0.01–0.5 weight percent of slip agent which is different than said bis erucamide; and (d) about 0.01–0.5 weight percent anti-block agent which is different than said bis erucamide and slip agent; said percentages based on the weight of the ethylene polymer.

3,969,305

METHOD OF MAKING AN ACRYLIC SPINNING SOLUTION

Arthur A. Armstrong, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1973, Ser. No. 428,497

Int. Cl.² C08J 3/08; C08K 5/20, 5/41; C08L 32/20

U.S. Cl. 260—32.6 N 3 Claims

1. The method of making a spinning dope, comprising

a. mixing a mixture of water and a filament forming acrylonitrile-containing polymer with a solvent for said polymer to form a slurry, said polymer containing at least 35 weight percent acrylonitrile, said slurry being made up of 5 to 30 weight percent polymer, up to 20 weight percent water and 70 to 80 weight percent solvent, said solvent being selected from the group consisting of dimethylacetamide, dimethylformamide and dimethylsulfoxide,

b. heating the slurry under a pressure and at a temperature and time sufficient to dissolve the polymer in the solvent to form a polymer solution, said heat and pressure being sufficient to raise the temperature of the solution to a point above the gel profile of said solution, and then

c. passing the polymer solution through a vaporization zone to remove a major portion of the water therefrom, said zone having a pressure which is lowered along the zone in such a manner that the pressures at points in said zone define a pressure profile which decreases along said zone, said pressure profile being sufficiently high to vaporize the water from the polymer solution while maintaining the polymer solution above the gel profile of said solution throughout said zone.

3,969,306

STABILIZED POLYESTER COMPOSITIONS

Willem F. H. Borman, Pittsfield, and Eugene P. Reilly, Lenox, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 20, 1972, Ser. No. 307,925
Int. Cl.² C08L *67/06*
U.S. Cl. 260—33.6 R **25 Claims**

1. A stabilized composition comprising
i. a high molecular weight linear polyester resin normally tending to undergo thermal scission and
ii. a stabilizing quantity of a polybutadiene, having a vinyl content of at least 85%.

3,969,307

MOLDING OF POLY(ARYLENE SULFIDE) RESINS

Charles W. Osborn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1975, Ser. No. 558,257
Int. Cl.² C08G *23/00*, *51/04*
U.S. Cl. 260—37 R **7 Claims**

1. In a method of molding an article from a poly(arylene sulfide) resin; the improvement which comprises incorporating a pigment in the resin and molding an article from the resulting resin at a mold temperature below about 200°F. and thereafter treating the molded article with water at a temperature of at least about 180°F. for a period of time sufficient to reduce darkening of the article.

7. A molded article formed from a poly(arylene sulfide) resin having a pigment incorporated therein, said article having been molded at a mold temperature below about 200°F. and thereafter treated with water at a temperature of at least about 180°F.

3,969,308

POLYMER COMPOSITIONS

Richard John Penneck, Lechlade, England, assignor to Raychem Limited, London, England

Continuation-in-part of Ser. No. 273,991, July 21, 1972, abandoned. This application Jan. 13, 1975, Ser. No. 540,447
Int. Cl.² C08L *83/04*
U.S. Cl. 260—37 SB **5 Claims**

1. A process for the manufacture of a composition comprising a silicone polymer, a non-silicone polymer other than polytetrafluoroethylene and a chemically treated filler, the chemically treated filler being a filler comprising an inorganic silicone-containing compound containing the Si—O—Si group and having a specific surface area (measured by the BET method) of at least 40 square meters per gram, which filler has been treated with at least one silane having bonded to each silicon atom thereof at least one organic group bonding through a silicon-carbon bond, which process comprises:
a. blending said non-silicone polymer, said silane and said filler to form a blend of said non-silicone polymer and said treated filler; and blending the resulting blend with said silicone polymer.

3,969,309

SILICONE CHANNEL SEALANT

John H. Wright, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,320
Int. Cl.² C08L *83/04*
U.S. Cl. 260—37 SB **26 Claims**

1. A silicone channel sealant comprising 100 parts by weight of a diorganopolysiloxane of 50 to 200,000 centipoise viscosity at 25°C, where the organo groups are selected from monovalent hydrocarbon radicals and cyanoalkyl, 10 to 150 parts by weight of powdered polytetrafluoroethylene, 4 to 25 parts by weight of untreated silica, 4 to 25 parts of a treated silica, 0.3 to 2.0 parts by weight of a titanate of the formula,

$$(RO)_4\,Ti$$

where R is selected from alkyl radicals and haloalkyl radicals of 2 to 5 carbon atoms, from 0.3 to 2.0 parts by weight of an aliphatic hydrocarbon compound containing at least one hydroxy group and from 10 to 50 parts by weight of styrene beads.

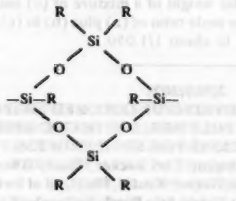
3,969,310

SILICONE RUBBER COMPOSITIONS

Kunio Itoh; Naohiko Harada, and Masaki Tanaka, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,345
Claims priority, application Japan, Aug. 29, 1974, 49-99286
Int. Cl.² C08L *83/04*
U.S. Cl. 260—37 SB **11 Claims**

1. A silicone rubber composition consisting essentially of (a) an organopolysiloxane containing in a molecule at least two alkenyl groups directly bonded to silicon atoms and at least one linearly-linked cyclic siloxane unit represented by the formula



where each R which may be identical or different, and is a substituted or unsubstituted monovalent hydrocarbon group, (b) an organohydrogenpolysiloxane represented by the average formula

$$R_a'H_bSiO_{\frac{4-a-b}{2}}$$

where R' is same as R above, a is 1 to 2, and b is 0.2 to 1.2 with the proviso that $(a + b)$ is 1.8 to 3.0, and having at least two hydrogen atoms directly bonded to silicon atoms per molecule, in an amount enough to provide from 0.8 to 2.5 hydrogen atoms directly bonded to silicon atoms for each alkenyl group present in component (a) above, and (c) a catalytic amount of platinum or a platinum compound.

3,969,311

FIBER REINFORCED POLYESTER RESIN HAVING A LOW SURFACE PROFILE

Hideo Kubota, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1975, Ser. No. 564,713
Int. Cl.² C08L 67/06
U.S. Cl. 260—40 R 4 Claims

1. A fiber reinforced molded article, having a low profile surface, which article is formed by heating under pressure a uniformly dispersed blend consisting essentially of:

filling, reinforcing, and process aiding ingredients comprising by weight:

a. from about 90 to about 130 parts of a fibrous reinforcing filler;

b. from about 145 to about 250 parts of a mineral filler; and

matrix forming ingredients consisting essentially of by weight:

c. about 50 parts of an unsaturated polyester formed from a linear aliphatic alpha, beta-unsaturated dicarboxyliic acid and/or anhydride having from 4 to 6 carbon atoms and a polyhydric alcohol, said polyester having an acid number of from 5 to 40; and

d. 40 to 60 parts of a monomeric copolymerizable diluent solution comprising proportionally about 1 part by weight of styrene and from about 1 to 2 parts by weight of tertiary butyl styrene.

3,969,312

COLORED FILAMENTS

Gerard Lees, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 2, 1971, Ser. No. 159,242
Claims priority, application United Kingdom, July 10, 1970, 33639/70
Int. Cl.² C08K 5/08, 5/23
U.S. Cl. 260—40 P 8 Claims

1. A process for the manufacture of filaments or films which comprises forming a melt of a fiber or film-forming polyester including a proportion of at least one coloring material which is soluble in the melt and extruding the colored melt to form filaments or films, said coloring matter being a disperse azo dye as listed in the Color Index and being further characterized by decomposing substantially completely when heated in a nitrogen atmosphere at 290°C for no longer than 120 seconds, said melt being extruded at a temperature and time in excess of the time and temperature at which said coloring matter decomposes.

3,969,313

THERMOPLASTIC COMPOSITE COMPOSITIONS

Itsuho Aishima; Yukichi Takashi; Yoshihiko Katayama; Kenji Arimoto, and Koichi Matsumoto, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 5, 1973, Ser. No. 367,311
Claims priority, application Japan, June 14, 1972, 47-58563; May 2, 1973, 48-48464
Int. Cl.² C08K 9/04, 9/10
U.S. Cl. 260—40 R 17 Claims

I. A thermoplastic composite composition comprising

I. about 95 to about 30 percent by weight of a thermoplastic material selected from the group consisting of polyamide, polyester, polyacetal, polycarbonate, polyphenylene oxide, polyvinylchloride and polystyrene, and

II. about 5 to about 70 percent by weight of a polyolefin composition comprising

A. about 15 to about 60 percent by weight of a polyolefin and

B. about 85 to about 40 percent by weight of at least one reactive inorganic filler,

said reactive inorganic filler having been prepared by effecting reaction between

a. an inorganic material substantially comprising at least one compound selected from the group consisting of metal carbonates, metal hydroxides and metal oxides, said metal being selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, zinc, cadmium and aluminum, said compound having a number average particle diameter of from about 0.01μ to about 50μ and a maximum particle diameter of about 100μ, and

b. at least one unsaturated aliphatic or aromatic carboxylic acid having from 3 to 11 carbon atoms, one or two ethylenic unsaturations, one or two carboxyl groups, the proportion of said unsaturated aliphatic or aromatic carboxylic acid being from about 0.05 to 20 percent by weight of the total weight of said inorganic material,

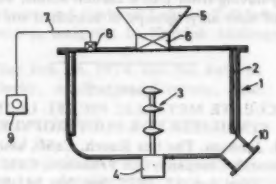
with stirring and removal of the evolved water in the powder state of said inorganic material at a temperature up to the temperature at which said aliphatic or aromatic carboxylic acid begins to decompose.

3,969,314

PRODUCTION OF PLASTIC-FILLER MIXTURES

Hans Grigull, Cologne, Germany, assignor to Leybold-Heraeus GmbH & Co. KG, Cologne-Bayental, Germany

Filed July 3, 1974, Ser. No. 485,515
Claims priority, application Germany, July 5, 1973, 2334189
Int. Cl.² C08K 9/00
U.S. Cl. 260—42 10 Claims



1. In a method for mixing a plastic and fillers together to produce a mixture thereof, the improvement comprising initially subjecting the fillers, prior to mixing, to intensive predrying by creating an increased temperature and maintaining the fillers under a vacuum and then maintaining the plastic and fillers free of moisture during the actual mixing process by performing the mixing process at an increased temperature and under vacuum.

3,969,315

SYNERGISTIC ANTIOXIDANT COMBINATION OF ORGANIC PHOSPHITE AND AMINE

Howard C. Beadle, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 391,235, Aug. 24, 1973, Pat. No. 3,886,114. This application Mar. 10, 1975, Ser. No. 556,672
Int. Cl.² C08D 7/10
U.S. Cl. 260—45.8 NW 9 Claims

3. A composition with improved protection against heat and oxidation degradation comprising natural rubber and a synergistic mixture which consists essentially of about 0.50 to 1.75 parts of a phosphite selected from the group consisting of decakis (nonylphenyl) heptakis (dipropylene glycol) octaphosphite, tetrakis (nonylphenyl) polypropylene glycol 425 diphosphite, polyphenyl dipropylene glycol phosphite and mixtures thereof, and about 1.50 to 0.25 parts of an amine, selected from the group consisting of polymerized 1,2-dihy-

dro-2,2,4-trimethylquinoline, N,N'-di(2-octyl)-p-phenylenediamine, N,N'-diphenyl-p-phenylenediamine, diphenylamine-acetone reaction product, phenyl-β-naphthylamine and mixtures thereof.

3,969,316

3,5-DIALKYL-4-HYDROXYPHENYLALKYL SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

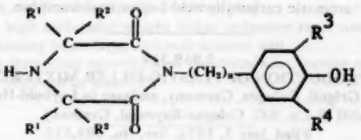
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 378,472, July 12, 1973, Pat. No. 3,919,234, which is a continuation-in-part of Ser. No. 237,981, March 24, 1972, abandoned. This application Oct. 15, 1975, Ser. No. 622,553

Int. Cl.² C07D 241/08; C08K 55/34

U.S. Cl. 260—45.8 N 5 Claims

1. A compound of the formula



wherein

R^1 and R^2 are independently of each other methyl or ethyl;

n is an integer of from 1 to 4; and

each of R^3 and R^4 is the same or different (lower)alkyl group having from 1 to 8 carbon atoms, wherein at least one of said alkyl groups is branched on the α carbon atom.

3,969,317

PARTICULATE METALLIC NICKEL ULTRAVIOLET STABILIZER FOR POLYPROPYLENE

Gordon B. Johnson, The Sea Ranch, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 17, 1975, Ser. No. 541,807

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 N 7 Claims

1. A poly-1-olefin composition comprising a major amount of substantially crystalline poly-1-olefin and from 0.05 to 5 percent by weight based on the poly-1-olefin of metallic nickel particles having an average particle size of from about 0.05 to about 5 microns.

3,969,318

SUBSTANTIALLY NON-INFLAMMABLE ACRYLONITRILE COPOLYMERS CONTAINING ANTIMONY

Eduard Radlmann; Heinz Schaffner; Günter Lorenz, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 12, 1975, Ser. No. 612,702

Claims priority, application Germany, Sept. 12, 1974, 2443573

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 B 4 Claims

1. A composition of matter which comprises

A. from 95 to 99.9% by weight of a copolymer of acrylonitrile and a vinyl halide, a vinylidene halide or a mixture thereof and, optionally, at least one other copolymerisable compound: and

B. from 0.1 to 5% by weight of a substantially water-insoluble complex antimony compound containing amide groups, the complex antimony compound being obtainable by esterifying an α-hydroxy polycarboxylic acid with a polyol in a molar ratio of the carboxyl groups to the hydroxyl groups in the polyol of at least 2 : 1 and in the presence of an acid transesterification catalyst, reacting the esterification product with an antimony oxide in a polar organic solvent at a temperature in the range of from 100° to 200° C to form a clear solution still containing free carboxyl groups, adding a monoisocyanate to the resulting solution at a temperature below 100° C in such a quantity that the free carboxyl groups are converted into the corresponding amide groups, and optionally removing the solvent.

3,969,319

STABILIZATION OF HALOGEN-CONTAINING POLYMERS

Ronald Eric Hutton, Southport; Vincent Oakes, St. Helens, and Brian Rodney Iles, Liverpool, all of England, assignors to Akzo N.V., Arnhem, Netherlands

Filed Nov. 29, 1974, Ser. No. 528,549

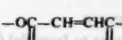
Claims priority, application United Kingdom, Nov. 30, 1973, 55549/73

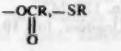
Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 S 8 Claims

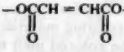
1. A composition comprising a halogen-containing resin and a stabilizing synergistic mixture of from 0.05 up to 5 parts by weight per 100 parts by weight of the resin of:

a first stabiliser (a) having the formula $R_x Sn Z_{(4-x)}$ where x= 1, 2 or 3, Z represents an anion selected from the group consisting of —S $(CH_2)_n$COOR' where n=1 or 2,



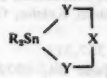


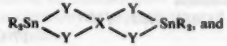
and — S —, and, in addition, where x=2,

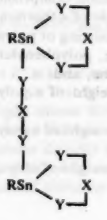


and — $S(CH_2)_2COO$ —, R represents a radical selected from the group consisting of alkyl containing 1 to 18 carbon atoms, cycloalkyl, aryl, aralkyl and alkaryl, and R' represents a radical selected from the group consisting of the radicals represented by R and the residue of a polyol containing 2 to 6 hydroxyl radicals;

a second stabilizer (b) selected from the group consisting of







where R has the above meaning, X represents the residue of a polyol containing 2 to 6 hydroxyl radicals and Y represents oxygen or sulphur.

3,969,320

RECOVERY OF RESINOUS COMPOSITIONS CONSISTING OF, AND INCLUDING, POLYPHENYLENE ETHERS IN PARTICULATE FORM FROM LIQUID MEDIA

Michael M. Modan, Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 4, 1972, Ser. No. 311,820

The portion of the term of this patent subsequent to Dec. 28, 1988, has been disclaimed.

Int. Cl.[2] C08G *65/34, 65/44, 65/46*

U.S. Cl. 260—47 ET 19 Claims

1. A process for recovering a resinous composition consisting of or including a polyphenylene ether resin from a liquid medium having a component which vaporizes readily, said process comprising introducing the resinous composition and said liquid medium into an enclosed chamber through means to effect the atomization thereof, said resinous composition and said liquid medium being at a temperature of from about 15°C to about 32°C, atomizing the resinous composition and said liquid medium under pressure into said enclosed chamber and producing an atomized spray of fine droplets of the resinous composition and said liquid medium in said chamber, mixing the fine droplets in said chamber with a hot inert gas, a superheated vaporized form of said component, or a mixture thereof, and flashing off said component which vaporizes readily, thereby forming particles of said resinous composition and a vaporized mixture of said component which vaporizes readily and said inert gas or said superheated vaporized form of said component, removing said vaporized mixture from said chamber, and collecting the resinous composition in a discrete particulate form.

3,969,321

MANUFACTURING PROCESS FOR PRODUCING REACTION PRODUCTS OF PHENOL-FORMALDEHYDE RESINS WITH LIQUID CHAIN-GROWTH POLYMERS OF HYDROCARBON DIENES

Yuji Kako, Shizuoka; Toyoji Kikuga, Fujieda, and Akira Toko, Yokohama, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 1, 1974, Ser. No. 510,875

Claims priority, application Japan, Oct. 3, 1973, 48-110487

Int. Cl.[2] C08G *8/30;* C08F *283/00*

U.S. Cl. 260—59 R 14 Claims

1. In the process for the preparation of a reaction product of a phenol-aldehyde resin and an olefinically unsaturated polymer the improvement which comprises employing as the unsaturated polymer a liquid chain growth polymer of a conjugated hydrocarbon diene monomer or mixture of said diene and a compatible hydrocarbon monoolefin comonomer, said mixture containing at least about 20 weight percent of said diene, said polymer being greater than a dimer, having a molecular weight less than 10,000 and being substantially devoid of conjugated unsaturation, said reaction of phenol aldehyde resin and liquid polymer being carried out in the presence of a strong acid catalyst.

3,969,322

NOVEL PROCESS AND PRODUCT

Isaac D. Rubin, Wappingers Falls; Richard F. Love, Fishkill, and Charles B. Holder, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

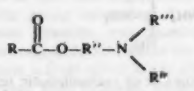
Division of Ser. No. 382,102, July 23, 1973, Pat. No. 3,890,357. This application Dec. 2, 1974, Ser. No. 528,980

Int. Cl.[2] C08G *6/00;* C08F *216/36*

U.S. Cl. 260—63 N 17 Claims

1. The method which comprises reacting (i) a nitroketonized polymer bearing pendant alpha nitroketone groups with (ii) a tertiary amino alcohol thereby forming a polymer bearing pendant aminoester groups; and recovering said polymer bearing said pendant aminoester groups.

13. A new aminoester polymer



wherein R is a polymer moiety, R''' and R[iv] are monovalent saturated hydrocarbon groups, and R is divalent saturated hydrocarbon, said polymer having been prepared by the method which comprises reacting (i) a nitroketonized polymer bearing pendent alpha nitroketone groups with (ii) a tertiary amino alcohol.

3,969,323

PHOTO-CROSSLINKABLE 2-PYRONE POLYMERS AND PROCESSES FOR THE MANUFACTURE THEREOF

Harald Furrer, Frankfurt am Main; Hartmut Steppan, Wiesbaden-Dotzheim, and Gerhard Lohaus, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Feb. 26, 1974, Ser. No. 445,981

Claims priority, application Germany, Mar. 1, 1973, 2310307

Int. Cl.[2] C08F *16/38;* C08G *63/46*

U.S. Cl. 260—73 R 16 Claims

1. A photo-crosslinkable polymer comprising about 5 to 100 mole per cent of polymerized vinyl or vinylidene units bonded via an ester, amide, or acetal group to a radical of a 2-pyrone compound, and about 0 to 95 mole percent of non-photosensitive comonomer units.

3,969,324

CONTINUOUS PROCESS FOR DRYING, CRYSTALLIZING AND SOLID STATE POLYMERIZING POLYESTERS

Eugene E. Berkau, Cincinnati, Ohio, and Cecil W. Capps, Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 217,515, Jan. 13, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,055

Int. Cl.[2] C08G *63/46*

U.S. Cl. 260—75 T 4 Claims

1. A continuous process for drying, crystallizing and solid state polymerizing of fiber-forming crystallizable polyesters comprising conveying in a screw-type conveyor in a partial vacuum of about 0.5 mm Hg. through the transitionally coordinated steps of: (1) drying pellets of a specific viscosity of about 0.34, a carboxyl concentration of about 15 milequivalents per gram, and a particle size of between −10 and +20 mesh, at a temperature of not more than about 80°C until the water content of the flake is below 0.05%; then (2) crystallizing the pellets in a second zone during which the temperature is raised to about 230° – 240°C; and (3) solid state polymerizing the pellets at about 230° – 240°C until the specific viscosity of the polymer is about equal to or greater than 0.55.

3,969,325

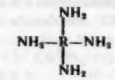
PRODUCTION OF PARTICULATE BBB TYPE POLYMER HAVING AN UNUSUALLY HIGH SURFACE AREA

Anthony B. Conciatori, Chatham, and Rufus S. Jones, Jr., Dover, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,996
Int. Cl.² C08G 69/28, 69/32
U.S. Cl. 260—78.41 16 Claims

1. In a process for forming a BBB type polymer comprising condensing with intimate admixture

a. at least one organic tetra-amine having the structural formula



wherein R is an aromatic or cycloaliphatic tetravalent radical and wherein each of the four amino groups is attached directly to a carbon atom present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho or peri to another carbon atom to which another of said amino groups is also directly attached, and

b. at least one tetracarboxylic acid or its corresponding half anhydride or dianhydride having the structural formula

wherein R′ is a tetravalent aromatic or cycloaliphatic radical wherein each of the four carboxyl groups is attached directly to a carbon atom present in a ring of said aromatic or cycloaliphatic radical in a position which is ortho or peri to another carbon atom to which another of said carboxyl groups is also directly attached; the improvement of conducting said condensation with agitation at a temperature of about 300° to 450°C. in the presence of a major concentration of a liquid aryl sulfone which is inert under the reaction conditions, with said BBB type polymer upon formation assuming the configuration of a particulate solid having an unusually high surface area of 100 to 500 square meters per gram and an inherent viscosity of at least 0.2 dl./gram.

3,969,326

CARBOXYL TERMINATED POLYCHLOROPRENES AND COMPOSITIONS CONTAINING THEM

Peter Henry Westermann, Dorking, England, assignor to BP Chemicals International Limited, London, England

Filed Sept. 12, 1974, Ser. No. 505,461
Claims priority, application United Kingdom, Sept. 28, 1973, 45436/73; Jan. 16, 1974, 1949/74
Int. Cl.² C08F 4/32, 36/18
U.S. Cl. 526—11.1 23 Claims

1. A process for the production of carboxyl terminated polychloroprene which comprises polymerising chloroprene under homogeneous conditions in the presence of a peroxide initiator having two carboxyl terminal groups which form internal anhydrides, the chloroprene being brought into contact initially with substantially all the peroxide initiator employed.

3,969,327

THERMOSETTING ACRYLIC POWDERS

Ralph Stein; Willy Demarteau, both of Brussels; Georges Slinckx, Bierges, and August Vrancken, Dworp, all of Belgium, assignors to U.C.B., Societe Anonyme, Brussels, Belgium

Filed July 11, 1974, Ser. No. 487,800
Claims priority, application United Kingdom, July 13, 1973, 33431/73
Int. Cl.² C08F 2/38, 220/06, 220/56; C08J 3/12
U.S. Cl. 526—1 13 Claims

1. Telechelic or semi-telechelic polymers, the average composition of which corresponds to the formula

$$V\text{+}(X)_x\text{-}(Y)_y\text{+}Z$$

wherein

V is a hydrogen atom or Z;

X is the radical originating from the opening of the double bond of an ethylenically unsaturated monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, a hydroxy-C_2-C_4-alkyl acrylate, a hydroxy-C_2-C_4-alkyl methacrylate, glycidyl acrylate, glycidyl methacrylate, N-methylolacrylamide, N-methylolmethacrylamide, an N-C_1-C_4-alkoxymethylacrylamide, and an N-C_1-C_4-alkoxymethyl-methacrylamide;

Y is the radical originating from the opening of the double bond of an ethylenically unsaturated monomer selected from the group consisting of a C_1-C_8-alkyl acrylate, a C_1-C_8-alkyl methacrylate, acrylamide, methacrylamide, styrene and alpha-methyl-styrene;

Z is the radical derived by removing a hydrogen atom from the SH group of a mercaptan selected from the group consisting of thioglycolic acid, thiolactic acid, mercaptopropionic acid, thiomalic acid, beta-mercaptoethanol, thioglycerol, cysteamine, cysteine and the lower alkyl esters of cystein, when V is a hydrogen atom, or Z is the radical originating from the decomposition of a radical polymerization initiator selected from the group consisting of 4,4′-azo-bis(4-cyanopentanoic acid) and 3,3′-azo-bis(3-cyanobutanol) when V = Z;

x is a number between 0 to 10;

y is a positive number and represents the required number of molecules of Y to ensure that the molecular weight of the polymer chain is between 2,000 and 8,000; the x radicals X and the y radicals Y being statistically distributed along the $-(X)_x-(Y)_y-$ polymer chain according to polymerization kinetics.

6. A thermosetting acrylic powder composition comprising:

A. 100 parts by weight of at least one binder consisting of a telechelic or semi-telechelic polymer according to claim 1.

B. 0 to 100 parts by weight of cross-linking agent,

C. 0 to 100 parts by weight of pigment,

D. 0 to 100 parts by weight of conventional filler,

E. 0 to 5 parts by weight of catalyst, and

F. 0 to 80 parts by weight of conventional additives for an acrylic powder composition.

3,969,328

COPOLYMERS OF VINYL CHLORIDE AND 2-HYDROXYPROPYL-ALKYL MALEATE

Dieter Kurz, and Alex Sabel, both of Burghausen, Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Filed Mar. 29, 1974, Ser. No. 456,131
Claims priority, application Germany, Apr. 4, 1973, 2316919
Int. Cl.² C08F 2/24, 214/06
U.S. Cl. 526—320 6 Claims

1. Copolymers of vinyl chloride and 2-hydroxypropyl-alkyl maleates consisting of a copolymerizate with from 65% to 95% by weight of vinyl chloride monomer units, and from 5% to 35% by weight of 2-hydroxypropyl-isononyl maleate mono-

mer units, said copolymerizate having a K-value of from 25 to 40 measured in cyclohexanone.

3,969,329

PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT ACRYLAMIDE WATER-SOLUBLE POLYMERS BY CONTROLLING THE VISCOSITY OF THE POLYMERIZATION REACTION MEDIUM WITH A WATER-MISCIBLE ORGANIC SOLVENT

Eiichi Hirata, Toyonaka; Shin-ichi Isaoka, Kyoto, and Shiro Sakai, Higashiosaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Jan. 16, 1975, Ser. No. 541,623

Claims priority, application Japan, Jan. 16, 1974, 49-8069

Int. Cl.² C08F *28/00*; C08G *75/00*; C08F *120/52*; B01D *21/01*

U.S. Cl. 260—79.3 M 7 Claims

1. A process for producing water-soluble high molecular weight polymers having a high degree of polymerization which comprises initiating the polymerization of acrylamide or a monovinyl monomer mixture containing a predominant amount of acrylamide in an acetone-water mixture at a temperature of not lower than 5°C. but of lower than 25°C. in the presence of polyvinyl alcohol and a catalyst, the concentration of the monomer in the polymerization reaction mixture being 15 to 30% by weight and the concentration of acetone in the acetone-water mixture being 15 35% by weight, and continuing the polymerization reaction while controlling the viscosity of the reaction system by adding at least one water-miscible organic solvent selected from the group consisting of acetone, acetonitrile, dioxane and tetrahydrofuran to the reaction system during the progress of the polymerization reaction.

3,969,330

AMINE MODIFIED POLYMERS

Evalds Lasis, and Ernest Jack Buckler, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sept. 30, 1974, Ser. No. 510,725

Claims priority, application Canada, Nov. 8, 1973, 185359

Int. Cl.² C08F *236/06*; C08C *19/12*, *19/18*

U.S. Cl. 526—14 14 Claims

1. A synthetic rubber composition having improved green strength comprising the reaction product of (A) a rubbery polymer of a C_4 – C_6 conjugated diolefin and a copolymerizable monomer having a tertiary amine group in the monomer in sufficient amount to provide along the polymer chain from about 0.5 to about 10 millimoles of tertiary amine groups per 100 grams of polymer, with (B) a halogen containing organo compound in sufficient amount to provide from 0.1 to 10 millimoles of halogen groups per 100 grams of polymer containing two or more halogen groups capable of forming quaternary ammonium salts with said tertiary amine groups, said composition being characterized by a change in modulus in the green state from 100% extension to 200% extension of not less than −10% and an elongation to break in the green state of not less than 250%.

3,969,331

HYDROCARBON POLYMER

Ernest E. Fauser, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 317,991, Dec. 26, 1972, which is a continuation of Ser. No. 72,528, Sept. 15, 1970, which is a continuation of Ser. No. 600,726, Dec. 12, 1966, abandoned. This application May 21, 1975, Ser. No. 579,351

Int. Cl.² C08F *210/00*, *212/00*

U.S. Cl. 526—66 4 Claims

1. A polymer, having a low cross-linked content, consisting essentially of from about 20 to about 73 percent by weight of units derived from ethylene, from about 25 to about 70 percent by weight of units derived from propylene, and from about 1.0 to about 3.5 percent by weight of units derived from ethylidene bicycloheptane having a boiling point of about 55°C at a reduced pressure of about 32 millimeters of mercury based on 100 percent by weight of the polymer, and wherein the said polymer has a dilute solution viscosity in the range of from about 0.8 to about 3 and a cross-linked content of less than about 1.5 percent by weight, determined by the amount of 0.25 gram of polymer which is insoluble in 50 milliliters of toluene at 80°C after 48 hours, prepared by the method which comprises polymerizing the monomers ethylene, propylene and said bicycloheptene by incremental addition of said monomers to the polymerizate at a temperature in the range of about −20°C to about 40°C in the presence of a solvent and a catalyst prepared by mixing at least one vanadium compound selected from the group consisting of vanadium tetrachloride, vanadium oxytrichloride, vanadium acetylacetonate, vanadium oxy bis(acetylacetonate) and vanadium tri-n-butoxyvanadate and at least one organoaluminum compound selected from the group consisting of aluminum triisobutyl, diethylaluminum chloride, ethylaluminum dichloride and ethylaluminum sesquichloride, where the mole ratio of aluminum to vanadium is from about 3/1 to about 10/1, where said solvent is selected from benzene, toluene, tetralin, pentane, isopentane, neopentane, heptane, hexane, 2,2,4-trimethyl pentane, petroleum ether, cyclopentane, cyclohexane, methyl cyclohexane, decalin and tetrachloroethylene, and where said dilute solution viscosity can be determined from relating the viscosities of a toluene solution of 0.5 gram of said polymer per 100 milliliters of solution and of said toluene at 30°C.

3,969,332

POLYMERIZATION OF ETHYLENE

Pierre Gloriod, Bully-les-Mines; Bernard Levresse, Lillebonne, and Jean-Pierre Machon, Bethune, all of France, assignors to Ethylene Plastique, Courbevoie, France

Filed Aug. 20, 1974, Ser. No. 499,106

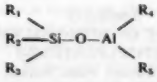
Claims priority, application France, Aug. 21, 1973, 73.30328

Int. Cl.² C08F *4/66*, *10/02*

U.S. Cl. 526—128 6 Claims

1. A method for the polymerization or copolymerization of ethylene comprising polymerizing the ethylene at a pressure greater than 500 bars, at a temperature within the range from 160° to 280°C and under conditions in which polymerization takes place in a single liquid phase, in the presence of a catalyst system comprising

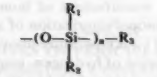
A. an alkylsiloxalane derivative of the formula:



(1)

wherein

R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrocarbon radicals having from one to ten carbon atoms, and R_5 is



(2)

wherein

R_1, R_2 and R_3 are selected from the group consisting of hydrocarbon radicals having from 1 to 10 carbon atoms;

the Si:Al ratio in the alkyl siloxalane being within the range from one to three; and

B. a titanium trichloride; the constituents A and B being taken in amounts to give an Al/Ti ratio between 1 and 10.

3,969,333

MANUFACTURE OF COPOLYMERS OF 4-METHYLPENTENE-1

Johann Nickl, Bad Durkheim; Hans Schick, Mannheim, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 6, 1975, Ser. No. 547,636

Int. Cl.² C08F *2/38, 4/52, 210/00, 210/14*

U.S. Cl. 526—154 **5 Claims**

1. A process for the manufacture of copolymers of 4-methylpentene-1 containing up to 10 polymerized units, by weight, of one or more other $C_{2-10}\alpha$-alkene per 100 units, by weight, of 4-methylpentene-1 by copolymerization of a liquid excess of the mixture of 4-methylpentene-1 with one or more other $C_{2-10}\alpha$-alkenes at (1) a temperature above room temperature and (2) in the presence of hydrogen using (3) a Zeigler/Natta catalyst system consisting of (3.1) a titaium trichloride component and (3.2) an alkyl aluminum component, the atomic ratio of titanium in catalyst component (3.1) to aluminum in catalyst component (3.2) being from 1:1 to 1:100, wherein polymerization is carried out

a. at a temperature of from 90° to 150°C,

b. in the presence of an inert gas consisting of nitrogen, helium, neon, argon or krypton or a mixture thereof, and

c. at a partial pressure (c_1) of inert gas of from 0.1 to 17 atmospheres absolute and a partial pressure (c_2) of hydrogen of 0.01 to 10 atmospheres absolute, with the proviso (c_3) that the sum of the partial pressures of inert gas, hydrogen and 4-methylpentene-1 is from 3 to 20 atmospheres absolute.

3,969,334

PROCESS FOR PREPARING GRANULAR CHLOROPRENE POLYMER RUBBER

Akihiko Shimizu, and Yasuhiro Sakanaka, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Oct. 15, 1975, Ser. No. 622,454

Claims priority, application Japan, Oct. 15, 1974, 49-117o93

Int. Cl.² C08C *1/14, 1/16*

U.S. Cl. 526—17 **5 Claims**

1. A process for preparing granular chloroprene polymer rubber which comprises adding 4 – 10 wt. parts of sodium silicate to 100 wt. parts of a cationic latex of chloroprene polymer or copolymer, then adding an alkaline earth metal salt or an acid to precipitate granules of the chloroprene polymer rubber.

3,969,335

MANUFACTURE OF HOMOPOLYMERS OF 4-METHYLPENTENE-1

Johann Nickl, Bad Durkheim; Hans Schick, Mannheim, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 6, 1975, Ser. No. 547,643

Int. Cl.² C08F *4/52, 110/14*

U.S. Cl. 526—154 **7 Claims**

1. A process for the manufacture of homopolymers of 4-methylpentene-1 by homopolymerization of a liquid excess of 4-methylpentene-1 at (1) a temperature above room temperature and (2) in the presence of hydrogen, using (3) a Ziegler/-Natta catalyst system consisting of (3.1) a titanium trichloride component and (3.2) an alkyl aluminum component, the atomic ratio of titanium in the catalyst component (3.1) to aluminum in the catalyst component (3.2) being from 1:1 to 1:100, wherein polymerization is carried out

a. at a temperature of from 90° to 150°C,

b. in the presence of an inert gas consisting of one or more of nitrogen, helium, neon, argon and krypton,

c. at a total pressure of the polymerization system of from 3 to 20 atmospheres absolute and

d. with the proviso that the partial pressure (d_1) of the inert gas in the polymerization system is from 0.1 to 17 atmospheres absolute and the hydrogen partial pressure (d_2) in the polymerization system is from 0.01 to 10 atmospheres absolute.

3,969,336

METHOD OF SEPARATING AND RECOVERING SOLUBLE PROTEINS FROM PROTEIN CONTAINING SOLUTIONS EMPLOYING FOAM FRACTIONATION

Larry Grant Criswell, Columbus, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,242

Int. Cl.² A23J *1/20*

U.S. Cl. 260—112 R **5 Claims**

1. A method of separting soluble proteins from a whey liquid containing said proteins employing foam fractionation, said method comprising:

providing a vessel for retaining said whey liquid;

preheating said whey liquid at a temperature from about 160° F. to about 180° F.;

introducing the liquid into the vessel to provide a pool thereof in the bottom of the vessel;

maintaining the temperature of said whey liquid in the range of about 95° F. to about 120° F.;

introducing air into said pool to form a foam;

allowing the foam to rise within said vessel;

maintaining the height of the foam at least about 2 feet above the liquid pool;

removing the foam containing the soluble protein from the top of said vessel;

said foam being removed from the whey liquid in said vessel without precipitation and acid addition to the whey liquid.

3,969,337

CHROMATOGRAPHIC FRACTIONATION OF WHEY

Karl Lauer, Schriesheim; Georg Stoeck, Mannheim-Waldhof, and Friedrich Bätz, Lampertheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Mar. 27, 1974, Ser. No. 455,484

Claims priority, application Germany, Apr. 18, 1973, 2319581

Int. Cl.² A23J *1/20*

U.S. Cl. 260—112 R **8 Claims**

1. The process for the chromatographic fractionation of dairy whey containing lactose, proteins and mineral salts into a protein fraction comprising passing said whey through a column of a cation exchange material in neutral form, said cation exchange material comprising a polystyrene resin containing sulfonic acid groups, thereafter passing an aqueous eluant consisting essentially of water through said column, and collecting a plurality of sequential aqueous effluents from said column as a plurality of separate fractions.

3,969,338

PROTEIN OBTAINED FROM CAKES OF VEGETABLE ORIGIN

Thadée Joseph Staron, Noisy-le-Roi, France, assignor to Institut National de la Recherche Agronomique, Paris, France

Division of Ser. No. 124,132, March 15, 1971, Pat. No. 3,803,328. This application Jan. 17, 1974, Ser. No. 434,308

The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl.² A23L *1/20;* **C12D** *13/06*

U.S. Cl. 260—123.5 **1 Claim**

1. Protein β which is the product of contacting cake obtained from vegetable seeds in maceration condition in an aqueous medium with the microorganism *Geotrichum candidum* at a temperature and for a time sufficient for removal

of the toxic substances from the cake and thereafter separating the cake from the aqueous medium, having the following composition on the basis of amino acids:

Aspartic acid	2.4	%
Threonine	3.0	
Serine	3.2	
Glutamic acid	26.0	
Proline	9.2	
Glycine	4.1	
Alanine	3.8	
Valine	3.9	
Cystine	4.8	
Methionine	2.4	
Isoleucine	3.2	
Leucine	6.1	
Tyrosine	1.4	
Phenylalanine	2.8	
Ammonia Liquor	2.3	
Lysine	6.8	
Histidine	3.5	
Arginine	5.6	
Tryptophanne	0.9	
Cellulose	0	%

said protein β being water soluble, having an ultraviolet absorption spectrum with a peak at 225 mμ, being homogeneous with electrophoresis and migrating towards the anode, having an isoelectric pH of 12.2, hydrochloric hydrolysis freeing all the amino acids, and having the property of precipitating the natural polymers polyuronides and nucleic acids.

3,969,339

WATER-SOLUBLE PENTAKIS-AZO DYESTUFFS DERIVED FROM 4,4'-DIAMINOAZOBENZENE

Andre Louis Sailer, and Pierre Frank, both of Du Rhone, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

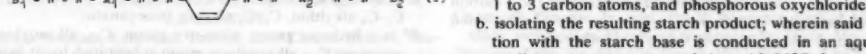
Filed Sept. 14, 1973, Ser. No. 397,177

Claims priority, application France, Sept. 14, 1972, 72.32530

Int. Cl.² C09B *31/30*; D06P *3/32*

U.S. Cl. 260—159 **5 Claims**

1. Pentakisazo dyestuff of the formula:



(I)

in which A_1 and A_2 are the same or different and each is monosulpho-naphthylene, hydroxy-monosulpho-naphthylene or hydroxy-disulpho-naphthylene and B_1 and B_2 are the same or different and each is dihydroxy-phenyl, diamino-phenyl, diamino-tolyl, diamino-sulpho-phenyl, amino-hydroxy-phenyl, N-(sulpho-methyl)-amino-hydroxy-phenyl, amino-naphthyl, hydroxy-naphthyl, hydroxy-sulpho-naphthyl, amino-sulpho-naphthyl, amino-hydroxy-monosulpho-naphthyl, amino-hydroxy-disulpho-naphthyl, phenyl-methyl-hydroxy-pyrazolyl, (dichloro-sulpho-phenyl)-methyl-hydroxy-pyrazolyl, (sulphophenyl)-methyl-hydroxy-pyrazolyl, 1-carbethoxy-2-oxo-propyl, N-phenyl-1-carbamoyl-2-oxy-propyl, N-(sulpho-phenyl)-1-carbamoyl-2-oxo-propyl, 2,4-dioxo-3-pentyl, dicarbethoxy-methyl, phenyl-carboxy-hydroxy-pyrazolyl, N-tolyl-1-carbamoyl-2-oxo-propyl, or N-(chlorophenyl)-1-carbamoyl-2-oxo-propyl.

3,969,340

RETORT STARCHES PREPARED FROM BLENDS OF STARCH AND HIGH AMYLOSE STARCH COMPONENTS

Martin M. Tessler, Edison, and Wadym Jarowenko, Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed July 10, 1974, Ser. No. 487,013

Int. Cl.² A23L *1/195*; C08B *31/10*

U.S. Cl. 260—233.3 R **5 Claims**

1. A cross-linked, hydroxypropylated starch product comprising:

a. 15–85% by weight, of a starch containing at least 50% amylose; and

b. the remainder of the product comprising a starch containing up to 36% amylose;

said product being hydroxypropylated and cross-linked to an extent such that an aqueous dispersion containing 5.0% of said starch product has a Brookfield viscosity measured at 180°F. of less than 2,000 cps. after being cooked at 5.0% starch solids concentration dry basis, in a pH 6.5 buffered salt solution at 212°F. for 10 minutes, followed by 15 minutes at 250°F. and standing at room temperature until it cools to 180°F.; and a Brookfield viscosity measured at 75°F. of greater than 1,500 cps. when said cooked starch is allowed to stand at room temperature for 24 hours; said viscosity measured at 75°F. being at least about five times greater than the viscosity at 180°F.; the degree of hydroxypropylation being such that when the two starch components are blended together prior to being hydroxypropylated, the resulting blend is hydroxypropylated to an M.S. of 0.10–0.30 and when the two starch components are separately hydroxypropylated prior to blending, the starch component containing at least 50% amylose has a hydroxypropyl M.S. of 0.10–0.30 and the starch containing less than 50% amylose has a hydroxypropyl M.S. of 0.06–0.30.

3,969,341

METHOD FOR THE PREPARATION OF STARCH PRODUCTS AND THE COMPOUNDS UTILIZED THEREFOR AND THE PRODUCT THEREOF

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 26, 1975, Ser. No. 552,890

Int. Cl.² C08B *31/02*

U.S. Cl. 260—233.5 **11 Claims**

1. A method for preparation of modified starch products comprising the steps of:

a. reacting a starch base with about 3–125%, by weight of the starch base, of a salt of the reaction product of a 2-alkyl-2-oxazoline, wherein the alkyl group contains from 1 to 3 carbon atoms, and phosphorous oxychloride, and

b. isolating the resulting starch product; wherein said reaction with the starch base is conducted in an aqueous medium at a temperature of about 15–95°C. for a period of about 1–24 hours at a pH level of about 9.0–13.0.

3,969,342

DERIVATIVES OF PENICILLANIC ACID AND COMPOSITIONS CONTAINING THEM

Jean Bouchaudon, Morsang-Sur-Orge, France, assignor to Rhone-Poulenc Industries, Paris, France

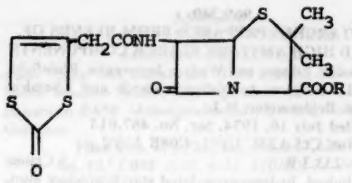
Filed Oct. 24, 1975, Ser. No. 625,503

Claims priority, application France, Oct. 28, 1974, 74.35972

Int. Cl.² C07D *499/48*

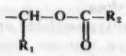
U.S. Cl. 260—239.1 **6 Claims**

1. A derivative of penicillanic acid of formula:



(I)

in which R is hydrogen or a radical which can be easily removed enzymatically of formula:



(II)

in which R_1 is hydrogen or straight or branched chain C_{1-4} alkyl, phenyl or phenyl C_{1-2} alkyl and R_2 is straight or branched C_{1-4} alkyl or alkoxy, cyclohexyl, phenyl or phenyl C_{1-2} alkyl, and, when R is hydrogen, its pharmaceutically acceptable non-toxic metal salts and addition salts with pharmaceutically acceptable nitrogen-containing bases.

3,969,343

TRIAZOLO[4,3-d][1,4]BENZODIAZEPINE-3,6-DIONES

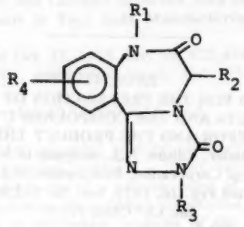
Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 27, 1975, Ser. No. 544,470

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—239.3 T **16 Claims**

1. A compound having the structure



wherein R_1 is hydrogen, alkyl, phenyl or benzyl; R_2 is hydrogen or alkyl R_3 is alkyl, phenyl or arylalkyl; and R_4 is hydrogen, halogen, nitro, cyano, trifluoromethyl, alkyl, alkoxy or alkylthio; and wherein alkyl in all instances is alkyl of 1 to 4 carbon atoms, alkoxy in all instances is alkoxy of 1 to 4 carbon atoms and aryl in all instances is phenyl or phenyl substituted with 1 or 2 alkyl, alkoxy or halogen substituents.

3,969,344

METHOD OF PURIFYING POLYMERIZABLE ORGANIC SUBSTANCES

Jacob Ackermann, Varese, and Pierino Radici, Como, both of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy

Filed Nov. 4, 1971, Ser. No. 195,840

Claims priority, application Italy, Nov. 12, 1970, 31632/70

Int. Cl.[2] C07D *201/16*

U.S. Cl. 260—239.3 A **11 Claims**

1. A process for purifying a polymerizable monomer selected from the group consisting of trioxane, 1,3-dioxolane, caprolactone and caprolactam by removing impurities in the form of water, alcohols and carboxylic acids; said process consisting of contacting a liquid consisting only of said monomer in liquid form at a temperature of not greater than 130° centigrade and at a pressure sufficient to keep said monomer in liquid form with a solid absorbent consisting essentially of a porous reticulated macromolecular alkali metal or alkaline earth metal salt of a cationic exchange resin containing carboxylic, sulfonic or phosphoric acid groups, said cationic exchange resin having a specific surface area of at least one square meter per gram and a pore diameter of from $10^{1.3}$ to 10^5 angstroms and recovering the purified monomer.

3,969,345

20β,21-EPOXY-3α-HYDROXY-5α-PREGNANES AND DERIVATIVES THEREOF

Gordon Hanley Phillipps, Wembley, and Christopher Earle Newall, London, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

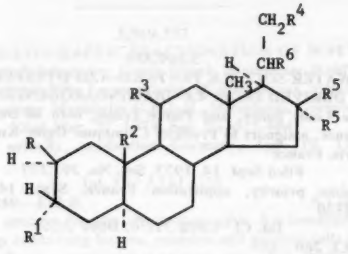
Division of Ser. No. 208,961, Dec. 16, 1971, Pat. No. 3,882,151. This application Feb. 20, 1975, Ser. No. 551,315

Claims priority, application United Kingdom, Dec. 17, 1970, 60065/70

Int. Cl.[2] C07J *5/00*

U.S. Cl. 260—239.55 R **4 Claims**

1. A compound of the formula:



wherein:

R is hydrogen, halogen, C_1–C_6 alkanoyloxy, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_5 alkyl or thiocyanato;

R^1 is a hydroxy group, nitro-oxy group, C_{1-5} alkanoyloxy group or C_{1-5} alkanoyloxy group substituted by at least one halogen atom or carboxy or amino group;

R^2 is hydrogen or methyl;

R^3 is oxygen or

R^4 is chlorine, bromine or iodine atom, a p-toluene sulphonyloxy or methanesulphonyloxy group or a C_{1-6} alkoxy, C_{3-6} cycloalkoxy, phenyl C_{1-6} alkoxy or phenoxy group or such a hydrocarbyloxy group substituted by at least one halogen atom or carboxyl, C_{1-6} alkoxy carbonyl, C_{1-6}-alkoxy or cyano group;

R^5 is hydrogen or C_1–C_6 alkyl

R^6 is hydroxy or R^4 and R^6 together are —O— to form an epoxy group joining the 20- and 21- positions.

3,969,346

NAPHTHOLACTAMCARBINOLS COLOR FORMERS, THEIR MANUFACTURE AND USE IN PRESSURE-SENSITIVE OR THERMOREACTIVE RECORDING MATERIAL

Stefan Koller, Ramlinsburg, and Jean Claude Petitpierre, Kaiseraugst, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

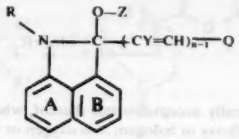
Filed July 3, 1973, Ser. No. 376,256

Claims priority, application Switzerland, July 7, 1972, 10207/72

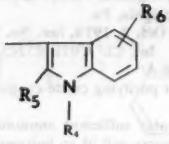
Int. Cl.² C07D *209/90*

U.S. Cl. 260—240 E 6 Claims

1. Color former of the formula



in which R is alkyl with 1 to 6 carbon atoms, cyclohexyl, phenyl, benzyl, 2-phenylethyl or alkyl with 1 to 6 carbon atoms substituted by halogen or alkoxy with 1 to 4 carbon atoms, Z is hydrogen or alkyl with 1 to 4 carbon atoms, Y is alkyl with 1 to 4 carbon atoms, nitrile or hydrogen, *n* is 1 or 2, Q is a radical of the formula



wherein R_4 is phenyl, tolyl, benzyl, 2-phenylethyl or alkyl or alkenyl with 1 to 18 carbon atoms or such a radical further substituted by chlorine, nitrile, carbalkoxy with 1 to 4 carbon atoms or alkylcarbonamido with 1 to 4 carbon atoms or R_4 is hydrogen; R_5 is hydrogen, phenyl or alkyl with 1 to 4 carbon atoms and R_6 is alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms or halogen.

3,969,347

PROCESS FOR THE MANUFACTURE OF THE POTASSIUM SALT OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE

Erwin Schmidt, Kelkheim, Taunus; Karl Clauss, Rossert, Taunus; Hartmut Pietsch, Hofheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 16, 1975, Ser. No. 596,217

Claims priority, application Germany, July 18, 1974, 2434548

Int. Cl.² C07D *291/06*

U.S. Cl. 260—243 R 5 Claims

1. A process for the manufacture of the potassium salt, practically free of fluoride, of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide by cyclization of acetoacetamide-N-sulfofluoride, which comprises reacting acetoacetamide-N-sulfofluoride with at least two moles potassium hydroxide, potassium methylate or a mixture of potassium hydroxide and potassium methylate per mole of sulfofluoride in methanol as solvent containing less than 50 % by weight of water at a temperature of from −20° to +60°C and separating the crystalline potassium salt of the oxathiazinone dioxide from the reaction solution.

3,969,348

PROCESS FOR THE MANUFACTURE OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE-2,2-DIOXIDE

Hartmut Pietsch, Hofheim, Taunus; Karl Clauss, Rossert, Taunus; Erwin Schmidt, Kelkheim, Taunus, and Harald Jensen, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

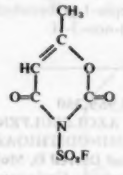
Filed July 16, 1975, Ser. No. 596,231

Claims priority, application Germany, July 18, 1974, 2434562

Int. Cl.² C07D *291/06*

U.S. Cl. 260—243 R 6 Claims

1. A process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide or the nontoxic salts thereof, which comprises reacting 6-methyl-2,3-dihydro-1,3-oxazin-2,4-dione-3-sulfo-fluoride of fomrula I



(I)

with at least one mole water per mole of fluoride to obtain acetoacetamide-N-sulfo-fluoride with splitting off of CO_2, treating the acetoacetamide-N-sulfofluoride with an aqueous or alcoholic base or combination thereof and isolating the oxathiazinone or the salts thereof.

3,969,349

VULCANIZATION OF RUBBER WITH PHOSPHORO TRIAZINE SULFIDES

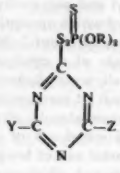
Chester D. Trivette, Jr., and Otto W. Maender, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 421,126, Dec. 3, 1973, Pat. No. 3,867,358. This application Jan. 8, 1975, Ser. No. 539,266

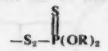
Int. Cl.² C07D *251/38*

U.S. Cl. 260—247.1 M 10 Claims

1. A compound of the formula

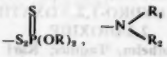


in which Y is



or

and Z is



or Cl in which each R independently is alkyl of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl, and R_1 and R_2 independently are hydrogen, alkyl of 1–8 carbon atoms, cycloalkyl of 5–8 carbon atoms, benzyl, phenyl or tolyl or

is a heterocyclic radical selected from the group consisting of pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino, 4-methylpiperidino, morpholino, thiomorpholino, 2,6-dimethylmorpholino, hexahydro-1H-azepin-1-yl, hexahydro-1(2H)-azocin-1-yl, and azabicyclo(3.2.2)-non-3-yl.

3,969,350

BASE CATALYSIS OF AZOLESULFENAMIDES AND SULFUR TO AMINODITHIOAZOLES

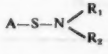
John J. D'Amico, Akron, and Darrell D. Mullins, Norton, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 235,081, March 15, 1972, abandoned. This application July 1, 1974, Ser. No. 484,675

Int. Cl.² C07D *277/78*

U.S. Cl. 260—247.1 H **9 Claims**

1. The method of preparing an aminodithioazole which comprises reacting sulfur and azolesulfenamide of the formula



in which A is selected from the class consisting of

a. aryleneazole selected from the group consisting of benzothiazolyl, naphthothiazolyl, benzoxazolyl and benzimidazolyl,

b. substituted said aryleneazole in which the substituents are chlorine, bromine, lower alkyl, lower alkoxy or nitro,

c. thiazolyl,

d. substituted thiazolyl in which the substituents are lower alkyl, lower acyl or lower alkoxy carbonyl and

e. tetrahydrobenzothiazolyl,

R_1 and R_2 are selected from the group consisting of lower alkyl, benzyl, alicyclic of 5 to 8 carbon atoms, and together with the nitrogen R_1 and R_2 form a heterocycle selected from the group consisting of morpholino, dimethylmorpholino, 3-azabicyclo(3.2.2)non-3-yl and polymethyleneimino of 4 to 8 methylenes one or more of which are optionally substituted by lower alkyl in the presence of about 5–20% of the number of moles of azolesulfenamide of a catalyst selected from the group consisting of alkali metal hydrosulfide, alkali metal hydroxide, alkali metal salt of mercaptobenzothiazole, alkali metal salt of mercaptobenzimidazole, alkali metal salt of mercaptobenzoxazole, alkali metal salt of di(lower alkyl)dithiocarbamic acid, alkali metal salt of lower alkyl xanthic acid, alkali metal salt of thiophenol, alkali metal lower alcoholate, alkali metal thiocyanate and alkali metal phosphate.

3,969,351

MORPHOLINE CONTAINING ISOTHIOCYANOBENZOXAZOLES

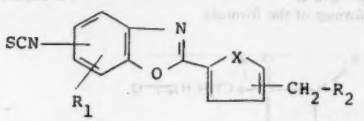
Venkatachala L. Narayanan, Hightstown; Glenn Anthony Jacobs, Princeton, and Rudiger D. Haugwitz, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 471,083, May 17, 1974, abandoned. This application May 15, 1975, Ser. No. 577,587

Int. Cl.² C07D *413/14*

U.S. Cl. 260—247.1 H **8 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, alkoxy or halogen; X is oxygen or sulfur; and R_2 is, 4-morpholinyl or 4-thiamorpholinyl; wherein alkyl and alkoxy are groups having 1 to 6 carbon atoms.

3,969,352

CRUDE CYANURIC ACID PURIFICATION

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 2, 1974, Ser. No. 511,447

Int. Cl.² C07D *251/32*

U.S. Cl. 260—248 A **45 Claims**

1. A process for purifying crude cyanuric acid, which comprises:

a. mixing in water sufficient amounts of crude cyanuric aciid and a mono- salt of an inorganic acid, wherein said inorganic acid is a dibasic or tribasic inorganic acid capable of forming a salt with a material selected from the group consisting of ammonium, potassium, sodium, lithium, rubidium, and cesium, wherein said salt contains the acid radical and one or more unreacted hydrogen atoms, to form a 10% to 45% crude cyanuric acid slurry containing about 10% to about 30% mono- salt of an inorganic acid;

b. heating the slurry to a temperature of about 160°C to about 220°C under at least the autogenously developed pressure to digest the crude cyanuric acid impurities;

c. cooling the digested cyanuric acid slurry to precipitate the cyanuric acid crystals; and

d. recovering the cyanuric acid crystals from the digestion solution.

3,969,353

TRIAZINESULFENIMIDES OF DICARBOXYLIC ACIDS

Werner Schwarze, Frankfurt, and Siegfried Wolff, Merten, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

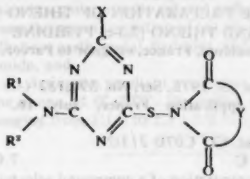
Filed June 19, 1975, Ser. No. 588,649

Claims priority, application Germany, June 24, 1974, 2430143

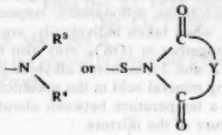
Int. Cl.² C07D *251/46, 251/52*

U.S. Cl. 260—249.5 **26 Claims**

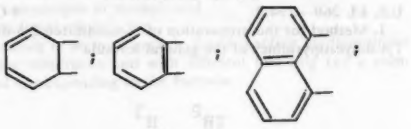
1. A triazine sulphenimide of the formula



in which
X is



R^1, R^2, R^3 and R^4 are hydrogen or alkyl with 1 to 4 carbon atoms;
Y is $-CH_2-CH_2-$; $-CH_2-CH_2-CH_2-$; $-CH(CH_3)-CH_2-$;



where R^5 and R^6 are hydrogen, alkyl with 1 to 8 carbon atoms, alkylthioalkyl with a total of 2 to 8 carbon atoms, CH_3-S-, alkoxyalkyl with a total of 2 to 8 carbon atoms, CH_3O- or phenyl,

where R^7 and R^8 are hydrogen, alkyl with 1 to 8 carbon atoms, allyl or phenyl.

3,969,354

2-(NITROMETHYLENE)-HEXAHYDROPYRIMIDINES

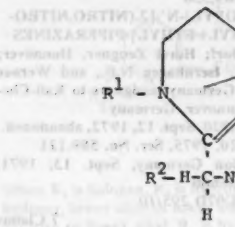
Charles H. Tieman; Willy D. Kollmeyer, and Steven A. Roman, all of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 510,100, Sept. 27, 1974, which is a continuation-in-part of Ser. No. 412,373, Nov. 1, 1973, abandoned. This application Nov. 7, 1975, Ser. No. 630,069

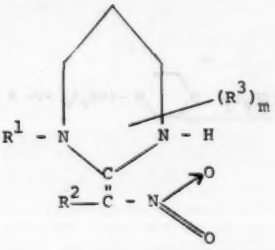
Int. Cl.² C07D *239/02*

U.S. Cl. 260—251 R **3 Claims**

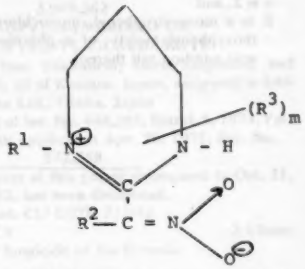
1. A compound of the group consisting of compounds of the formula:



derivatives thereof wherein the alpha hydrogen is replaced by middle halogen and resonance hybrids represented by the formulae:



and



wherein R^1 contains up to eight carbon atoms and is straight-chain alkyl, haloalkyl, alkenyl, (middle halo)alkenyl or alkynyl, R^3 is hydrogen, middle halogen or phenylthio, optionally substituted by one or more of middle halogen, nitro or alkyl or alkoxy of from 1 to 3 carbon atoms, R^3 is alkyl of one to eight carbon atoms, and m is 0 or 1, with the proviso that in said resonance hybrids the R^3 substituent may only replace a hydrogen at the carbon in the 4, 5 or 6 position.

3,969,355

5-AMINOETHYL-2,4-DIPHENYLPYRIMIDINE DIHYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 520,024, Nov. 1, 1974, Pat. No. 3,944,581. This application Oct. 24, 1975, Ser. No. 625,751

Int. Cl.² C07D *239/26*

U.S. Cl. 260—256.4 R **1 Claim**

1. The compound 1-(2,4-diphenyl-5-pyrimidyl)ethylamine dihyrobromide.

3,969,356

N-[3-(P-F-BENZOYL)-PROPYL]-N'-[2.(NITRO,NITROEL, OR METHOXYPHENYL)-ETHYL]-PIPERAZINES

Wolfgang Milkowski, Burgdorf; Horst Zeugner, Hannover; Klaus-Wolf von Eickstedt, Isernhagen N.B., and Werner Stuhmer, Eldagsen, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

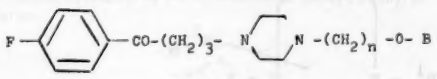
Continuation of Ser. No. 288,320, Sept. 12, 1972, abandoned. This application June 20, 1975, Ser. No. 589,121

Claims priority, application Germany, Sept. 13, 1971, 2145682; July 26, 1972, 2236680

Int. Cl.[2] C07D *295/10*

U.S. Cl. 260—268 R 7 Claims

1. A compound having the formula



in which

n is 2, and

B is a mononitrophenyl, monochloronitrophenyl, or methoxyphenyl moiety, or a pharmaceutically acceptable acid addition salt thereof.

3,969,357

3-PYRIDYLMETHYL PHENYL UREA METAL SALT COMPLEXES

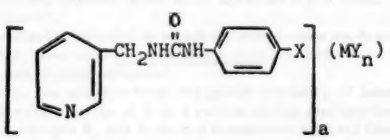
Ernest D. Weiler, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 28, 1974, Ser. No. 473,594

Int. Cl.[2] C07F *3/04, 3/06, 3/08, 15/06*

U.S. Cl. 260—270 PY 13 Claims

1. A compound of the structure



wherein

X is (a) —C(O)R_1 wherein R_1 is methyl, ethyl or propyl, (b) —SR_2, wherein R_2 is alkyl of 1 to 4 carbon atoms, or (c) cyano or (d) nitro;

M is a metal ion selected from the group consisting of cadmium, calcium, cobaltous, cupric, nickelous and zinc;

Y is a halide anion;

a is the integer 2 for all cations except cadmium and for this it is 1; and

n is an integer corresponding to the valence of M.

3,969,358

PROCESS FOR THE PREPARATION OF THIENO [3,2-c] PYRIDINE AND THIENO [2,3-c] PYRIDINE

Armand Amselem, Toulouse, France, assignor to Parcor, Paris, France

Filed June 25, 1975, Ser. No. 590,132

Claims priority, application France, July 16, 1974, 74.24633

Int. Cl.[2] C07D *213/28*

U.S. Cl. 260—294.8 C 7 Claims

1. Process for the preparation of a compound selected from the group consisting of thieno[3,2-c]pyridine and thieno [2,3-c]-pyridine, comprising cyclizing a compound selected from the group consisting of a N-(3,thienyl)methyl-N-[2,2-$(OR)_2$]ethyl-para-toluene sulfonamide and a N-(2-thienyl)-methyl-N-[2,2-$(OR)_2$]-ethyl-para-toluene sulfonamide, respectively, in which the radicals R, when taken individually, are lower alkyls and, when taken together in $(OR)_2$, may also form a group selected from the 2- and 3-membered alkylene groups, by treatment with a strong mineral acid in the presence of an inert organic solvent at a temperature between about 50°C and the boiling temperature of the mixture.

3,969,359

METHOD OF PREPARING N-SUBSTITUTED 3,5-DICYAN-1,4-DIHYDROPYRIDINES

Josef Kuthan; Jaroslav Palecek, and Miroslav Sramek, all of Prague, Czechoslovakia, assignors to Vysoka skola chemicko-technologicka, Prague, Czechoslovakia

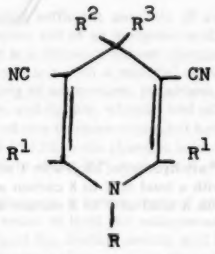
Filed Sept. 11, 1974, Ser. No. 505,006

Claims priority, application Czechoslovakia, Sept. 18, 1973, 6416-73

Int. Cl.[2] C07D *213/57*

U.S. Cl. 260—294.9 9 Claims

1. Method for the preparation of N-substituted 3,5-dicyan-1,4-dihydropyridines of the general formula



wherein

R represents a radical selected from the group consisting of (a) alkyl groups having from 1–6 carbon atoms, (b) cycloalkyl groups having from 5–8 carbon atoms and (c) aralkyl groups having 1–3 carbon atoms in the alkyl chain and from 6–10 carbon atoms in the aryl radical,

R^1 represents a radical selected from the group consisting of (a) alkyl groups having from 1–2 carbon atoms, (b) an unsubstituted phenyl group and (c) a phenyl group having alkyl substituents thereon containing from 1–2 carbon atoms,

R^2 represents a radical selected from the group consisting of (a) hydrogen, (b) alkyl groups having from 1–3 carbon atoms and (c) a complex containing 4–7 carbon atoms formed with R^3, and

R^3 represents a radical selected from the group consisting of (a) alkyl groups containing from 1–3 carbon atoms, (b) unsubstituted phenyl groups and (c) a phenyl group bearing alkyl substituents having from 1–2 carbon atoms which comprises the steps of successively

(1) reacting the corresponding unsubstituted dihydro derivative in a polar aprotic solvent with a compound selected from the group consisting of (a) alkali metal hydrides, (b) alkaline earth metal hydrides and (c) an alkali metal amide, and

(2) alkylating the resultant product at a temperature within the range of 0°–70°C, the molar ratio of components ranging from 1:1.0 to 1.5 : 1.0 to 1.5.

3,969,360

CATALYZED ALKYLATION OF HALOPYRIDINATES

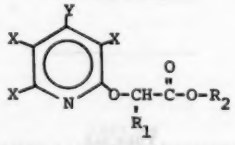
Harold H. Freedman, Newton Center, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1974, Ser. No. 535,249

Int. Cl.² C07D *213/26*

U.S. Cl. 260—295 R **10 Claims**

1. In the process of preparing a compound corresponding to the formula



wherein:

X independently in each occurrence is hydrogen or halo and at least one X is halo;

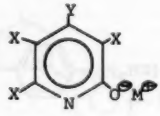
Y is hydrogen, halo or —NR′R″ wherein R′ and R″ are each independently hydrogen or lower alkyl;

R_1 is hydrogen or methyl; and

R_2 is lower alkyl;

by reacting in an inert organic liquid reaction medium under alkaline conditions and with efficient blending (a) a compound corresponding to the formula

(a)



wherein M is an alkali metal and X and Y have the aforesaid meaning, in solid particulate form with (b) a compound dissolved in said liquid reaction medium and corresponding to the formula $R_3CH(R_1)—C(O)—O—R_2$, wherein R_1 and R_2 have the aforesaid meaning and R_3 is chloro or bromo;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of a quaternary ammonium salt having a minimum solubility of at least one weight percent in the liquid reaction medium at 25°C and having a total aggregate carbon content of at least about 10 carbon atoms.

3,969,361

2-BENZOYL-3-AMINO-PYRIDINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

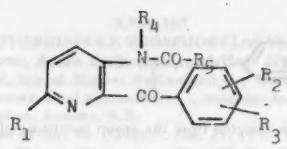
Continuation-in-part of Ser. No. 347,361, April 3, 1973, Pat. No. 3,875,176. This application Aug. 15, 1974, Ser. No. 497,750

Claims priority, application Austria, May 10, 1972, 4113/72

Int. Cl.² C07D *213/75*

U.S. Cl. 260—295 AM **11 Claims**

1. A pyridine compound of the formula



where R_1 is halogen, R_2 is hydrogen, halogen, trifluoromethyl, hydroxy, lower alkyl or lower alkoxy, R_3 is hydrogen, halogen, hydroxy or lower alkyl, R_4 is hydrogen or lower alkyl and R_5 is phenyl or halophenyl or a pharmacologically acceptable acid addition salt thereof.

3,969,362

ISOPROPYL-N-(5-BROMO OR CHLOROPYRIDYL-2)CARBAMATE

Ryohei Takahashi; Isao Yokomichi; Itaru Shigehara, and Terumasa Komyoji, all of Kusatsu, Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

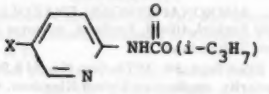
Continuation-in-part of Ser. No. 448,205, March 5, 1974, Pat. No. 3,914,240. This application Apr. 28, 1975, Ser. No. 572,288

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² C07D *213/42*

U.S. Cl. 260—295 CA **3 Claims**

1. An agricultural fungicide of the formula:



wherein X represents chlorine or bromine.

3,969,363

DERIVATIVES OF 1-PHENOXY-3-AMINO-PROPAN-2-OL AND PROCESS FOR THEIR PRODUCTION

Thomas Raabe, Rodenbach; Otto Gräwinger, Frankfurt am Main; Josef Scholtholt, Mittelbuchen; Rolf-Eberhard Nitz, Bergen-Enkheim, and Eckhard Schraven, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

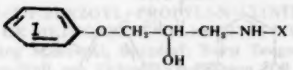
Filed Dec. 10, 1974, Ser. No. 531,325

Claims priority, application Luxemburg, Dec. 12, 1973, 69043

Int. Cl.² C07D *213/72*

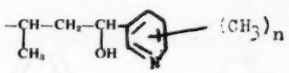
U.S. Cl. 260—296 AE **12 Claims**

1. Derivative of 1-phenoxy-3-amino-propan-2-ol having the formula



wherein X is selected from the group consisting of

and



wherein *n* is 1, 2 or 3 and the phenyl radical I can be monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms, alkenyl or alkinyl having in either case up to 6 carbon atoms, cycloalkyl or cycloalkenyl having in either case a ring having 5 to 8 carbon atoms, alkoxy having up to 8 carbon atoms, alkenyloxy or alkinyloxy having in either case up to 5 carbon atoms, phenyl, chlorine or bromine, or the radical $-NR_1R_2$, wherein R_1 represents alkyl having 1 to 4 carbon atoms or aryl-substituted or alkyl-substituted carbonyl radical derived from an aromatic or aliphatic carboxilic acid having up to 11 carbon atoms, and R_2 represents hydrogen or alkyl having up to 4 carbon atoms, or a pharmaceutically acceptable acid addition salt of said derivative.

3,969,364

AMINONAPHTHOSELENAZOLE

Aaron David Ezekiel, Ilford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

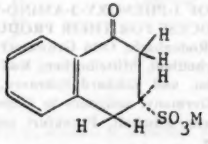
Filed Sept. 30, 1974, Ser. No. 510,945

Claims priority, application United Kingdom, Oct. 19, 1973, 48778/73; Oct. 19, 1973, 48779/73

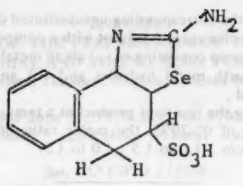
Int. Cl.² C07D *293/12*

U.S. Cl. 260—298 **3 Claims**

1. A process for the preparation of 2-aminonaphtho [1,2-d] selenazole which comprises halogenating an aqueous acetic acid solution of a 1,2,3,4-tetrahydro-1-oxonaphthalene-3-sulphonate or - sulphonic acid of the formula



wherein M is an alkali metal or a hydrogen atom by treatment with chlorine or bromine at a temperature of 20° to 100°C, increasing the pH of the reaction mixture to within the range of 5.0 to 9.5 and then reacting the halogenated compound with an aqueous solution of selenourea at a temperature of 20° to 100°C, to produce a compound of the formula



and then eliminating the sulphonic acid group by treatment with sodium hydroxide or potassium hydroxide.

3,969,365

4-(1,2,4-OXADIAZOLYLFORMAMIDOALKYL)PHENYL-SULFONYL UREAS

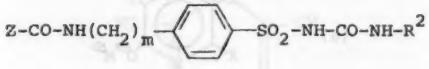
Hermann Breuer, Burgweinting, and Ivo Polacek, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 17, 1972, Ser. No. 227,276

Int. Cl.² C07D *271/06*

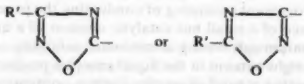
U.S. Cl. 260—307 G **11 Claims**

1. A compound of the formula



wherein

Z is an oxadiazole radical of the formula



wherein R' is hydrogen, a straight or branched chain alkyl or alkenyl radical of from 1 to 6 carbon atoms, a cycloalkyl radical of from 3 to 6 carbon atoms, cycloalkyl-alkyl wherein the cycloalkyl moiety has from 3 to 6 carbon atoms and the alkyl moiety has from 1 to 4 carbon atoms, $(R^3)_n$-phenyl, $(R^3)_n$-pheylalkyl wherein the akyl moiety has from 1 to 4 carbon atoms, R^3 is hydrogen, an alkyl or alkoxy radical of from 1 to 4 carbon atoms, or halogen, and *n* is 0, 1 or 2;

m is 1, 2 or 3; and

R^2 is

1. hydrogen, a straight or branched chain alkyl or alkenyl radical of from 1 to 6 carbon atoms, mercaptoalkyl of from 2 to 8 carbon atoms, or phenyl;
2. a radical of the formula

$-(CH_2)_p\text{-}E\text{-}(CH_2)_qCH_3$

wherein E is oxygen, sulfur or sulfonyl, p is from 2 to 7, and q is 0 to 5, the sum of $p + q$ being from 3 to 7;

3. phenylalkyl wherein the alkyl radical has from 1 to 3 carbon atoms or phenylcycloalkyl wherein the cycloalkyl radical has from 3 to 8 carbon atoms;
4. cycloalkyl or cycloalkenyl of from 3 to 8 carbon atoms or alkyl-substituted cycloalkyl or cycloalkenyl wherein the alkyl radical has from 1 to 3 carbon atoms;
5. endoalkylene cycloalkyl, endoalkylene cycloalkenyl, bisendoalkylene cycloalkyl or bisendoalkylene cycloalkenyl wherein the endoalkylene part has from 1 to 4 carbon atoms and the cycloalkyl or cycloalkenyl part has from 5 to 8 carbon atoms;
6. a saturated, mono- or di-unsaturated heterocyclic ring containing from 4 to 6 carbon atoms and an oxygen atom or a sulfur atom or a nitrogen atom
7. a saturated, mono- or di-unsaturated heterocyclic ring linked to the nitrogen atom by means of a methylene group and containing from 4 to 5 carbon atoms and either an oxygen or a sulfur atom.

3,969,366

3[SUBSTITUTED-2-(METHYLAMINO)PHENYL]4-[2-OXO-2-(HETEROCYCLIC)ETHYL]-5-SUBSTITUTED-1,2,4-TRIAZOLES

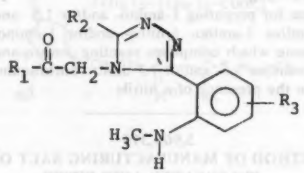
Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 30, 1975, Ser. No. 582,549

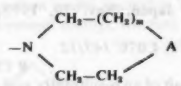
Int. Cl.² C07D *403/02*

U.S. Cl. 260—308 R **9 Claims**

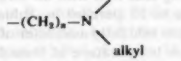
1. A compound of the formula



wherein R_1 and R_4 are the same or different and each is a N containing heterocycle of the formula



wherein m is 0 or 1; A is CH-Q; Q is hydrogen or alkyl of 1 to 4 carbons; R_2 is hydrogen, alkyl of 1–4 carbons, trifluoromethyl, phenyl, benzyl,



wherein each alkyl is of 1 to 4 carbons or $-(CH_2)_n-R_4$; n is an integer from 1 to 4; and R_3 is hydrogen, halogen, nitro, trifluoromethyl, alkyl of 1–4 carbons, alkoxy of 1–4 carbons, or alkylthio of 1–4 carbons; and a pharmaceutically acceptable salt thereof.

3,969,367

OCTAHYDROINDOLE PHOSPHORYLACYLAMINES

Elmar Sturm, Aesch, Switzerland, and Hans Jörg Cellarius, deceased, late of Riehen, Switzerland (by Herta Cellarius-Haigermoser, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

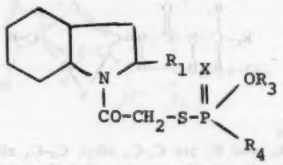
Division of Ser. No. 324,469, Jan. 17, 1973, Pat. No. 3,876,643. This application Jan. 30, 1975, Ser. No. 545,465

Claims priority, application Switzerland, Jan. 20, 1972, 910/72

Int. Cl.² C07D *209/12*

U.S. Cl. 260—326.12 R **5 Claims**

1. A phosphorylacylamine compound of the formula



wherein R_1 is hydrogen or methyl, R_3 is alkyl of from 1 to 4 carbon atoms, R_4 is alkoxy of from 1 to 4 carbon atoms, and X is oxygen or sulphur.

3,969,368

2-SUBSTITUTED BENZODIOXOLES

Elso Manghisi, Monza, and Aldo Salimbeni, Milan, both of Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

Filed Feb. 1, 1973, Ser. No. 328,633

Claims priority, application Italy, Feb. 9, 1972, 20407/72; Dec. 4, 1972, 32458/72

Int. Cl.² C07D *317/58, 317/72*

U.S. Cl. 260—340.5 **7 Claims**

1. N-((β-N',N'-diethylamino)ethyl)-2-(2-methyl-1,3-benzodioxol-2-yl)-acetamide or a pharmaceutically acceptable salt thereof.

3,969,369

BRUCEANTIN

S. Morris Kupchan, Charlottesville, Va., and Ronald W. Britton, Camlachie, Canada, assignors to Research Corporation, New York, N.Y.

Filed June 20, 1973, Ser. No. 371,634

Int. Cl.² C07D *311/20*

U.S. Cl. 260—343.2 R **5 Claims**

1. In a process of producing bruceantin, the sequential steps comprising:

a. extracting Brucea antidysenterica with an alkanol,
b. partitioning said alkanoic extract between chloroform and water,
c. removing the solvent from the chloroform fraction and partitioning said fraction between 10% aqueous methanol and petroleum ether,
d. separating said 10% aqueous methanol fraction and adding thereto sufficient water to produce a 20% aqueous methanol solution and extracting same with carbon tetrachloride,
e. further diluting said 20% aqueous methanol solution with sufficient water to provide a 40% aqueous methanol solution and extracting same with chloroform,
f. removing the chloroform, chromatographing on silica gel and eluting with chloroform containing up to 0.5% methanol,
g. eluting with 1% methanol in chloroform and collecting the first fractions which contain a compound which upon thin layer chromatography gives an immediate dark stain with ferric chloride.

3,969,370

1-TERTIARY-ALKYL-3-(SUBSTITUTED FURYL)UREAS AS ANTIHYPERTENSIVE AGENTS

Bruce I. Dittmar, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

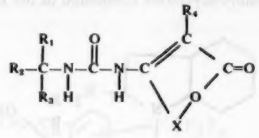
Continuation-in-part of Ser. No. 461,700, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,306

Int. Cl.² C07D *307/30*

U.S. Cl. 260—343.6 **8 Claims**

1. A compound selected from

a. compounds of the formula



where

R_1, R_2, and R_3 are C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, with the provisos that the total number of carbon atoms of R_1 plus R_2 plus R_3 does not exceed 6, that not more than one of R_1, R_2, or R_3 is alkynyl, and that two of R_1, R_2, and R_3 may be joined to form a cycloalkyl or cycloalkenyl group;

X is $—CH_2—$, methyl-substituted methylene, ethyl-substituted methylene, propyl-substituted methylene, or butyl-substituted methylene; and

R_4 is hydrogen or methyl with the proviso that when R_4 is methyl, X is methylene; and

b. sodium, potassium or calcium salts of compounds of (a) wherein X is methylene, methyl-substituted methylene, or ethylsubstituted methylene.

3,969,371

PROCESS FOR CONVERTING γ-BUTYROLACTONE INTO TETRAHYDROFURAN

Georg Michalczyk, Neukirchen-Vluyn, and Karl-Heinz Gluzek, Alpen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed July 15, 1974, Ser. No. 488,351

Claims priority, application Germany, Aug. 3, 1973, 2339344

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.1 R **4 Claims**

1. A process for converting γ-butyrolactone to tetrahydrofuran in the liquid phase which comprises treating said lactone with hydrogen in the presence of a cobalt modified copper chromite and aluminum oxide catalyst wherein said catalyst comprises from about 5.0 to 25.0 weight percent CoO, from about 5.0 to 30.0 weight percent CuO, from about 10.0 to 35.0 weight percent Cr_2O_3 and the balance aluminum oxide at a temperature of from about 100° to 350°C. and a pressure of from about 100 to 400 kg/cm².

3,969,372

2,3-DIHYDRO-3,3-DIMETHYL-2,5-BENZOFURANDIOL FROM ISOBUTYRALDEHYDE AND BENZOQUINONE

Robert D. Burpitt; David M. Pond, and Mary E. Dickerson, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 2, 1975, Ser. No. 583,339

Int. Cl.² C07D *307/83*

U.S. Cl. 260—346.2 R **3 Claims**

1. A method for preparing 2,3-dihydro-3,3-dimethyl-2,5-benzofurandiol which comprises reacting benzoquinone with at least an equal molar amount of isobutyraldehyde at a temperature of from about 20°to about 85°C. in the presence of a basic catalyst selected from tri-lower alkyl amines, tri-lower alkyl phosphines, alkali metal lower alkoxides, triethylenediamine, 1,5-diazabicyclo[4.3.0]non-5-ene, or quinuclidine.

3,969,373

FLUOROGENIC 2-OXY-3(2H)-FURANONE MATERIALS

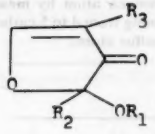
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application June 26, 1975, Ser. No. 590,655

Int. Cl.² C07D *307/60*

U.S. Cl. 260—347.3 **9 Claims**

1. A compound of the formula



wherein R_1 is lower alkyl or phenyl lower-alkyl, R_2 is phenyl, lower-alkoxyphenyl, di-lower-alkoxyphenyl, carboxyphenyl or carboxy-lower-alkylphenyl and R_3 is phenyl or nitrophenyl.

3,969,374

PROCESS FOR PREPARING AMINO-ANTHRAQUINONES

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal-Hahnenberg, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1975, Ser. No. 549,120

Claims priority, application Germany, Feb. 28, 1974, 2409542

Int. Cl.² C07C *97/24*

U.S. Cl. 260—382 **19 Claims**

1. Process for preparing 1-amino- and/or 1,5- and/or 1,8-diamino and/or 1-amino- 6-nitro- and/or 1-amino-7-nitro-anthraquinone which comprises reacting 1-nitro-and/or 1,5- and/or 1,8- and/or 1,6- and/or 1,7-dinitro anthraquinone with ammonia in the presence of a nitrile.

3,969,375

METHOD OF MANUFACTURING SALT OF α-SULFOFATTY ACID ESTER

Osamu Okumura, Funabashi; Takenobu Sakatani, Chiba; Kazuo Ohbu, and Masuzo Nagayama, both of Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,709

Claims priority, application Japan, Nov. 29, 1973, 48-134693

Int. Cl.² C11D *1/28;* **C07C** *143/12*

U.S. Cl. 260—400 **8 Claims**

1. A process for preparing a salt of an α-sulfofatty acid ester by sulfonating and then neutralizing a fatty acid ester having the formula RCH_2COOR', wherein R is alkyl having 8 to 18 carbon atoms and R' is alkyl having one to 5 carbon atoms, which comprises the steps of:

1. flowing a film of said fatty acid ester through a first reaction zone and contacting said film with an SO_3-inert gas mixture containing one to 15 percent by volume of SO_3, at a molar ratio of SO_3 to said fatty acid ester of from 1.0 to 1.5, at a first reaction temperature of from 50° to 85°C, and for a first contact time of from 0.5 to 30 seconds, to form an intermediate sulfonated reaction product,

2. flowing a film of said intermediate reaction product from step 1 through a second reaction zone and contacting the latter film with said SO_3-inert gas reaction mixture, at a

second reaction temperature of from 95° to 150°C, and for a second contact time of from 3 to 120 seconds, to form an α-sulfofatty acid ester reaction product, and

3. immediately neutralizing the reaction product of step 2 by mixing said reaction product of step 2 with a neutralizing agent selected from the group consisting of an aqueous solution of an alkali metal hydroxide, aqueous ammonia and an ethanol amine, at a neutralization temperature at less than 70°C and at a pH of from 6 to 10, to obtain a neutralized product containing at least 80 percent by weight of a salt of said α-sulfofatty acid ester having a low color value.

3,969,376

13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN E_1 ANALOGS

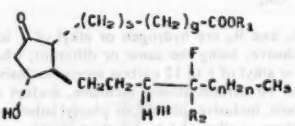
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 381,155, July 20, 1973, which is a continuation-in-part of Ser. No. 248,013, April 27, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,692

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein g is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,377

16-FLUORO PROSTAGLANDIN E_1 ANALOGS

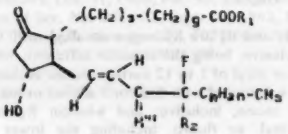
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,693

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein g is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,378

16-FLUORO PROSTAGLANDIN A_2 ANALOGS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

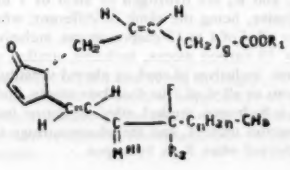
Division of Ser. No. 381,155, July 20, 1973, which is a continuation-in-part of Ser. No. 248,013, April 27, 1972, abandoned.

Filed Feb. 21, 1975, Ser. No. 551,697

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,379

13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN A_1 ANALOGS

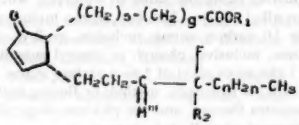
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,827

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,380

16-FLUORO PROSTAGLANDIN F_2 ANALOGS

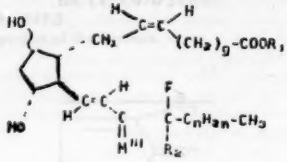
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,911

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **19 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ indicates attachment of hydroxyl to the ring in alpha or beta configuration; wherein *g* is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_2— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,381

13,14-DIHYDRO-16-FLUORO PROSTAGLANDIN B_1 ANALOGS

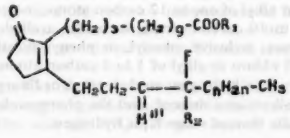
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 21, 1975, Ser. No. 551,912

Int. Cl.² C07C *61/38, 69/74*

U.S. Cl. 260—408 **17 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein g is an integer from 2 to 5, inclusive; wherein C_nH_{2n} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 6 carbon atoms, inclusive, in the chain between —CFR_7— and terminal methyl; wherein M''' is

or

wherein R_7 and R_8 are hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, being the same or different; wherein R_1 is hydrogen or alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,969,382

PROCESS FOR THE SIMULTANEOUS HYDROGENATION AND DEODORISATION OF FATS AND/OR OILS

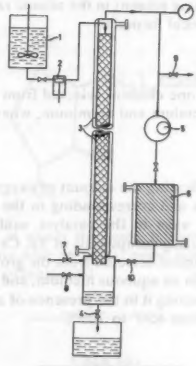
Kurt Zosel, Oberhausen, Germany, assignor to Studiengesellschaft Kohle m.b.H., Mulheim, Germany

Filed Aug. 29, 1974, Ser. No. 501,733

Claims priority, application Austria, Aug. 30, 1973, 7525/73

Int. Cl.² C11C *3/12*

U.S. Cl. 260—409 **22 Claims**



1. A process for the simultaneous hydrogenation and deodorisation of at least one product from the group consisting of fats and oils, wherein said product is contacted with carbon dioxide in an amount effective for the deodorisaton and containing hydrogen in an amount effective for the hydrogenation, at a temperature of from 100° to 250°C and a pressure of from 150 to 300 atmospheres in the presence of a catalyst for the hydrogenation.

3,969,383

FAT COMPOSITIONS STABILIZED WITH ESTERS OF FATTY ACIDS AND TERTIARY LOWER ALKYL SUBSTITUTED HYDROQUINONES AND METHOD THEREFROM

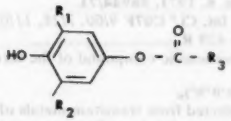
Martin Dexter, Briarcliff Manor, and Janet B. Peterson, Yonkers, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 431,179, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 129,123, March 29, 1971, abandoned, and a continuation-in-part of Ser. No. 847,390, Aug. 4, 1969, abandoned, which is a continuation-in-part of Ser. No. 590,549, Oct. 31, 1966, Pat. No. 3,459,704, which is a division of Ser. No. 224,602, Sept. 17, 1962, Pat. No. 3,294,836. This application Jan. 22, 1975, Ser. No. 543,084

Int. Cl.² C09F *5/08*

U.S. Cl. 260—410.5 **6 Claims**

1. A compound of the formula:



wherein

R_1 is an alkyl of 1 to 8 carbon atoms;

R_2 is a tertiary alkyl of 4 to 8 carbon atoms; and

R_3 is alkyl of 11 to 21 carbon atoms.

3,969,384

ESTERS OF CYCLOPROPANE ALKANOIC ACIDS

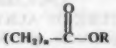
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 489,205, July 17, 1974, Pat. No. 3,925,461. This application June 11, 1975, Ser. No. 585,986

Int. Cl.² C07C *69/74*

U.S. Cl. 260—410.9 N **8 Claims**

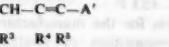
1. A compound selected from the formula:



wherein,

n is the integer 6, 8 or 10, and

R is alkenyl of four to sixteen carbon atoms, alkynyl of four to sixteen carbon atoms, phenyl or the group



in which each of R^3, R^4 and R^5 is hydrogen, A' is phenyl optionally substituted by chloro, lower alkyl or one to six carbon atoms or alkoxy of one to six carbon atoms, with the proviso that said compound contains at least 18 carbon atoms in the molecule.

3,969,385

ETHYL 10-METHOXY-3,7,11-TRIMETHYLDODECA-2,4-DIENOATE

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Dec. 6, 1974, Ser. No. 530,122
Int. Cl.² C11C 3/02
U.S. Cl. 260—410.9 R 3 Claims

1. The compound ethyl 10-methoxy-3,7,11-trimethyldodeca-2,4-dienoate.

3,969,386

ORGANO-METALLIC COMPOUNDS

Denis George Harold Ballard; Adrian Walter Parkins; Peter Anthony Robinson; Samuel Dimewere Ibekwe, all of Runcorn; Michael Franz Lappert, and Ronald Pearce, both of Brighton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 311,520, Dec. 4, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,303
Claims priority, application United Kingdom, Dec. 8, 1971, 56943/71; Dec. 8, 1971, 56944/71
Int. Cl.² C07F 9/00, 7/28, 11/00
U.S. Cl. 260—429 R 4 Claims

1. An organometallic compound of the formula

$$M(CH_2SiR^1R^2R^3)_m$$

where M is selected from transition metals of Groups IIIA to VIA of the Periodic Table of Elements, *m* is the prevailing valency of the metal M, said prevailing valency being 2, 3 or 4, and R^1, R^2 and R^3 are selected from hydrogen, alkyl, alkenyl, benzyl and alkoxyphenyl, at least one of R^1, R^2 and R^3 being alkenyl, benzyl or alkoxyphenyl.

3,969,387

METALIC-ORGANO-PEROXIDE AND ORGANO-METALIC-PEROXIDE AND PREPARATION THEREOF

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Filed Dec. 29, 1972, Ser. No. 319,293
Int. Cl.² C07F 5/06
U.S. Cl. 260—448 R 31 Claims

1. A method of forming a peroxy compound which comprises contacting and reacting:

a. a reactive aluminum comprising highly pure aluminum permeated with a metal having an atomic volume close to hydrogen; with

b. a liquid mixture of

i. hydrogen peroxide; and

ii. a carboxylic acid; and separating the peroxy compound from unreacted reactive aluminum.

3,969,388

MANUFACTURE OF ALKYLISOCYANATES

Hans Urbach, Lampertheim, and Albrecht Mueller, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 18, 1975, Ser. No. 569,209
Claims priority, application Germany, May 8, 1974, 2422211
Int. Cl.² C07C 118/00
U.S. Cl. 260—453 P 12 Claims

1. A process for the manufacture of alkylisocyanates by thermal decomposition of N-alkylcarbamic acid halides, wherein the N-alkylcarbamic acid halide is decomposed in the vapor state in from 2 to 6 successive reaction chambers at not less than 20°C above its boiling point, and the bulk of the hydrogen halide issuing from each reaction chamber is removed before the reaction mixture, in the vapor state, enters the next reaction chamber.

3,969,389

MANUFACTURE OF ALIPHATIC ISOCYANATES

Hans Urbach, Lampertheim, and Albrecht Mueller, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 3, 1975, Ser. No. 555,031
Claims priority, application Germany, Mar. 11, 1974, 2411441
Int. Cl.² C07C 118/00
U.S. Cl. 260—453 P 11 Claims

1. A process for the manufacture of aliphatic isocyanates by thermal decomposition of aliphatic carbamic acid halides in the presence of inert organic solvents, wherein, in a first reaction stage, an aliphatic carbamic acid halide is decomposed at a temperature not less than 25°C above its boiling point in the presence of a solvent which boils at or above this temperature, during which stage the hydrogen halide formed is removed, and then, in a second stage, the aliphatic isocyanate formed is isolated from the decomposition mixture.

3,969,390

CATALYTIC PROCESS FOR PREPARING UNSATURATED NITRILES FROM OLEFINS, AMMONIA AND OXYGEN

Franco Faletti; Nicola Giordano; Paolo Marinozzi; Joannes Bart, all of Milan, and Arsenio Castellan, Bollate (Milan), all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jan. 10, 1975, Ser. No. 540,165
Claims priority, application Italy, Jan. 11, 1974, 19334/74
Int. Cl.² C07C 120/14
U.S. Cl. 260—465.3 4 Claims

1. The process for the preparation of acrylonitrile or methacrylonitrile from propene or, respectively, isobutene, by reaction, in the gas phase, with ammonia and oxygen, in the presence of a solid catalyst system, at a temperature between 350° and 550°C, said process being characterized in that the catalyst system consists of the elements tellurium, cerium and molybdenum, and of at least one element selected from the group consisting of iron, chromium and aluminum, all of said elements being chemically combined with oxygen, and the various elements being present in the atomic ratios defined by the following empirical formula:

$$A_xC_yTe_vMo_{12}O_z$$

where A is at least one element selected from the group consisting of iron, chromium and aluminum, wherein:

$x = 0.3 - 4$;

$y = 1 - 10$;

$v = 1 - 10$; and

z is a number indicating the amount of oxygen bound to the other elements and corresponding to the oxidation state in which they exist in the catalyst, said catalyst being obtained by mixing compounds of Te, Ce and Mo and of at least one element selected from the group consisting of Fe, Cr and Al in an aqueous medium, and then drying the mixture and heating it in the presence of air at a temperature ranging from 450° to 700°C.

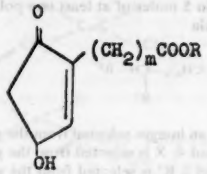
3,969,391

PREPARATION OF PROSTAGLANDIN PRECURSORS

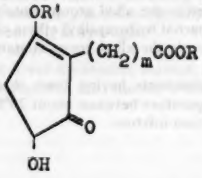
Raphael Pappo, Skokie, and Christopher Jung, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 249,667, May 2, 1972, abandoned. This application May 8, 1974, Ser. No. 467,847
Int. Cl.² C07C 51/00
U.S. Cl. 260—468 K 10 Claims

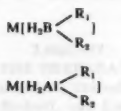
1. The process of producing a compound of the formula



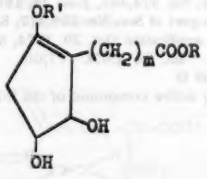
which comprises contacting, in an inert solvent at a temperature between about −90° to +10°C., a compound of the formula



wherein R is lower alkyl, R′ is lower alkyl, (lower alkoxy) lower alkoxy and *m* is an integer greater than 4 and less than 8 with a hydride reducing agent selected from compounds of the formula



wherein M is an alkali metal and R_1 and R_2 are hydrogen, lower alkyl or lower alkoxy, or from aluminum hydride, borane or zinc borohydride, to form, as an unisolated intermediate, a compound of the formula



and contacting, at about the same temperature, said unisolated intermediate with an acidic agent comprising a mineral acid or a strong organic acid.

3,969,392

TETRAHYDRO-CYCLOPROPA[B]NAPHTHALENES

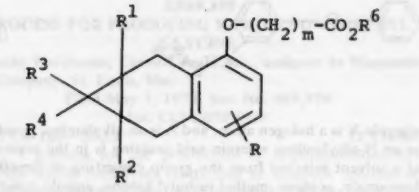
Venkatachala L. Narayanan, Hightstown, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 425,413, Dec. 17, 1973, Pat. No. 3,923,890, which is a division of Ser. No. 252,814, May 12, 1972, Pat. No. 3,796,760, which is a division of Ser. No. 73,668, Sept. 18, 1970, Pat. No. 3,694,512. This application Sept. 15, 1975, Ser. No. 613,720

Int. Cl.² C07C *69/76*

U.S. Cl. 260—473 F **1 Claim**

1. Compounds of the structure



wherein R is hydrogen, lower alkyl, lower alkoxy or cycloalkyl having 3 to 6 carbon atoms; R^1 and R^2 are the same or different and are hydrogen, lower alkyl or lower alkoxy; R^3 and R^4 are the same or different and are hydrogen, chlorine or bromine, at least one of R^3 and R^4 being other than hydrogen; R^6 is hydrogen, lower alkyl or aralkyl; and *m* is 1 to 10.

3,969,393

PROCESS FOR PREPARING CYCLOPROPANE-CARBOXYLIC ACID ESTERS

Toshio Mizutani; Yoshitaka Ume, both of Toyonaka, and Takashi Matsuo, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

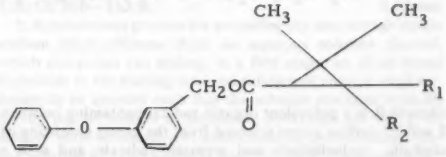
Filed Aug. 6, 1974, Ser. No. 495,154

Claims priority, application Japan, Aug. 6, 1973, 48–88674; Aug. 23, 1973, 48–94980

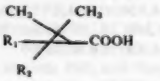
Int. Cl.² C07C *67/00*

U.S. Cl. 260—468 H **6 Claims**

1. A process for preparing an organic acid ester of the formula (I),

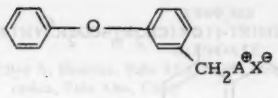


wherein R_1 is a hydrogen atom or a methyl group, R_2 is a methyl group, a vinyl group, a 2,2-dichlorovinyl group, a 1-propenyl group, a 2-methyl-1-propenyl group, a 2-carbomethoxy-1-propenyl group, a 2-methoxymethyl-1-propenyl group, a 1,3-butadienyl group, a 2-methyl-1,3-butadienyl group or a cyclopentylidenemethyl group when R_1 is a hydrogen atom, and R_2 is a methyl group when R_1 is a methyl group; which comprises reacting an acid of the formula (II).



(II)

wherein R_1 and R_2 are each as defined above, or its reactive derivative, or a mixture of the acid and its reactive derivative wherein said reactive derivative is selected from the group consisting of the alkali metal salt, ammonium salt and alkylammonium salt of the acid of formula (II), with a quaternary ammonium salt of the formula (III)



(III)

wherein X is a halogen atom, and A is an alkylamine, pyridine or an N-alkylaniline wherein said reacting is in the presence of a solvent selected from the group consisting of dimethylformamide, acetone, methyl isobutyl ketone, anisole, toluene, xylene, chlorobenzene and nitrobenzene and is conducted at a temperature lower than the boiling point of the solvent used and wherein the molar ratio of said quaternary ammonium salt to said acid or acid reactive derivative is between 1:0.76 to 1:1.27.

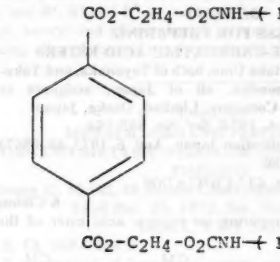
3,969,394

POLYURETHANES

Arthur M. Reader, Waynesboro, Va., assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,082
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **3 Claims**

1. A polyisocyanate compound corresponding to the formula:



wherein R is a polyvalent organic radical containing between 2 and 22 carbon atoms selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals; and *m* is a positive integer having a value of from 1 to about 5.

3,969,395

POLYMERS OF HYDROXY CARBOXYLIC ACID AND A POLYHYDRIC ALCOHOL

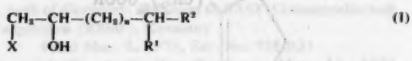
Alf-Göran Dahlberg, Nykvarn; Karl Gustav Hogberg, Sodertalje; Sven Lindvall, Sodertalje, and Thore Oskar Verner Rydh, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Division of Ser. No. 294,930, Oct. 4, 1972, Pat. No. 3,886,267. This application July 22, 1974, Ser. No. 490,404
Int. Cl.² C07C *69/66*
U.S. Cl. 260—484 R **25 Claims**

1. A physiologically innocuous, water swellable polymer which is the reaction product (per mole of component iii below) of

i. about 0.1 to 1.0 moles of at least one hydroxy carboxylic acid selected from the group consisting of arabonic acid, gluconic acid and glucoheptonic acid and salts and lactones derivable therefrom;

ii. about 0.05 to 5 moles of at least one polymerizing agent of the formula



(I)

wherein *n* is an integer selected from the group consisting of 0,1,2,3, and 4; X is selected from the group consisting of Cl, Br, and I; R^1 is selected from the group consisting of OH, Cl, Br, and I; and R^2 is selected from the group consisting of H, and if R^1 is OH also the radical —CH_2—X, wherein X has the meaning specified above, and diepoxides derivable therefrom; and

iii. at least one polyhydric alcohol selected from the group consisting of glycerol, polyglycerols, tetritols pentitols, hexitols, heptitols, partial alkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms, and partial hydroxyalkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms,

the polymer components having been reacted in aqueous solution at a temperature between about 20°C and the boiling point of the reaction mixture.

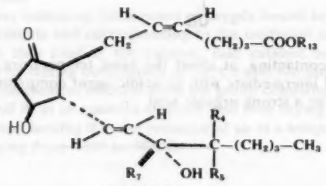
3,969,396

8β, 11β, 12α-PGE_2 COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 374,405, June 28, 1973, which is a continuation-in-part of Ser. No. 289,317, Sept. 15, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,436
Int. Cl.² C07C *177/00*
U.S. Cl. 260—468 D **5 Claims**

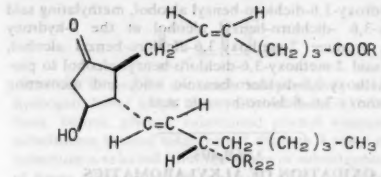
1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different; with the proviso that at least one of R_4 and R_5 is methyl; and

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_{13} is hydrogen.

5. An optically active compound of the formula



wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 10 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen;

wherein R_{22} is alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

3,969,397

PROCESS FOR THE PREPARATION OF L-DOPA

Ado Kaiser, Neu-Frenkendorf; Marcel Scheer, Basel; Werner Häusermann, Neuallschwil, and Leo Marti, Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

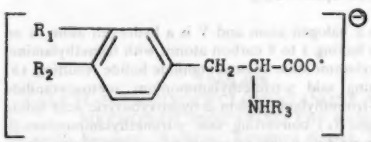
Filed Dec. 11, 1969, Ser. No. 884,333

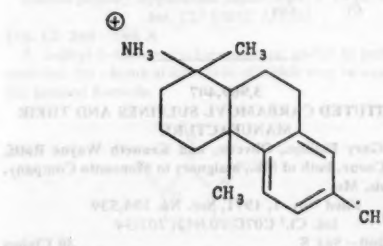
Claims priority, application Switzerland, Dec. 27, 1968, 19270/68

Int. Cl.² C07C *63/50*

U.S. Cl. 260—501.11 **19 Claims**

1. A compound of the formula





II

wherein R_1 is methoxy; R_2 is hydroxy and R_3 is benzoyl.

3,969,398

PROCESS FOR PRODUCING N-PHOSPHONOMETHYL GLYCINE

Arnold Hershman, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 1, 1974, Ser. No. 465,976

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.5 **12 Claims**

1. A process for the production of N-phosphonomethyl glycine which comprises contacting an aqueous solution of N-phosphonomethylimino diacetic acid with a molecular oxygen-containing gas at a temperature sufficiently elevated to initiate and sustain reaction and in the presence of a catalyst consisting essentially of activated carbon.

3,969,399

ELECTROPLATING PROCESSES AND COMPOSITIONS

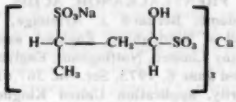
Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 55,959, July 17, 1970, Pat. No. 3,697,391. This application Oct. 26, 1971, Ser. No. 192,612

Int. Cl.² C07C *143/04, 143/10*

U.S. Cl. 260—513 R **1 Claim**

1. A compound of the formula:



3,969,400

CONTINUOUS PROCESS FOR DRYING SODIUM VINYL-SULFONATE

Jan Colle, Oostende, Belgium, assignor to U.C.B., Societe Anonyme, Brussels, Belgium

Filed Jan. 9, 1975, Ser. No. 539,933

Claims priority, application United Kingdom, Jan. 25, 1974, 3492/74

Int. Cl.² C07C *143/16*

U.S. Cl. 260—513 R **5 Claims**

1. A continuous process for preparing dry and storage stable sodium vinyl-sulfonate from an aqueous solution thereof, which comprises (a) adding, in a first stage, an alkali metal hydroxide to the starting aqueous solution of sodium vinyl-sulfonate in an amount such that the solution contains from 40 to 300 mg. of sodium or potassium hydroxide per 100 g. of sodium vinyl-sulfonate, (b) concentrating the resulting alkaline solution by evaporation in a second stage at a temperature of from 50° to 100°C. at a pressure of from 40 to 200 mm.Hg. to give an aqueous solution having a sodium vinyl-sulfonate concentration of from 40 to 55% by weight and (c) in a third stage, subjecting the resulting concentrated solution to drying at a temperature of from 50° to 100°C. at a pressure of from 40 to 200 mm.Hg. to give solid sodium vinyl-sulfonate, the water content of which is, at most, 2 % by weight.

3,969,401

α-AMINOPHENYLACETIC ACID COMPOUNDS AND DERIVATIVES

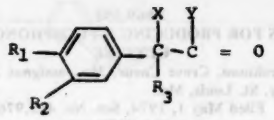
Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 34,870, May 5, 1970, Pat. No. 3,864,384. This application Aug. 14, 1973, Ser. No. 388,292

Int. Cl.² C07C *101/02*

U.S. Cl. 260—518 A **6 Claims**

1. A compound of the formula



where

R_1 is a member selected from the group consisting of cycloalkyl with 5 to 7 carbon atoms, lower alkyl substituted cycloalkyl, alkyl with 1 to 8 carbon atoms, phenyl, and phenyl substituted by a member selected from the group consisting of trifluoromethyl, halogen, lower alkylsulfonyl, and nitro;

R_2 is a member selected from the group consisting of halogen, nitro, trifluoromethyl and lower alkylsulfonyl, and if R_1 is substituted phenyl, hydrogen;

R_3 is a member selected from the group consisting of hydrogen and lower alkyl with 1 to 8 carbon atoms;

X is amino, lower alkanoylamino, di-(lower alkyl) amino; or lower alkylamino; and

Y is hydroxyl.

3,969,402

PHENYLALKANOIC ACIDS

Stewart S. Adams; Bernard J. Armitage, and John S. Nicholson, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Filed June 6, 1973, Ser. No. 367,614

Claims priority, application United Kingdom, June 15, 1972, 28104/72

Int. Cl.² C07C *65/14*

U.S. Cl. 260—520 R **1 Claim**

1. 2-(2-Hydroxy-4-biphenylylpropionic acid.

3,969,403

PROCESS FOR PREPARATION OF 2-METHOXY-3,6-DICHLORO-BENZOIC ACID

Heinz Manfred Becher, Bingen (Rhine), and Richard Sehring, Ingelheim am Rhein, both of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 480,685, June 19, 1974, Pat. No. 3,928,432. This application Oct. 1, 1975, Ser. No. 618,561

Claims priority, application Germany, June 22, 1973, 2331712

Int. Cl.² C07C *65/02*

U.S. Cl. 260—521 H **6 Claims**

1. A process for the preparation of 2-methoxy-3,6-dichlorobenzoic acid comprising the steps of catalytically debrominating 2-methoxy-5-bromo-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3,6-dichlorobenzyl alcohol, oxidizing said 2-methoxy-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3, 6-dichloro benzonic acid, and recovering said 2-methoxy-3,6-dichlorobenzoic acid.

3,969,404

PROCESS FOR PREPARATION OF 2-METHOXY-3,6-DICHLORO-BENZOIC ACID

Heinz Manfred Becher, Bingen (Rhine), and Richard Sehring, Ingelheim am Rhein, both of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 480,685, June 19, 1974, Pat. No. 3,928,432. This application Oct. 1, 1975, Ser. No. 618,560

Claims priority, application Germany, June 22, 1973, 2331712

Int. Cl.² C07C *65/02*

U.S. Cl. 260—521 H **4 Claims**

1. A process for the preparation of 2-methoxy-3,6-dichlorobenzoic acid comprising the steps of catalytically debrominating 2-hydroxy-5-bromo-3,6-dichloro-benzyl alcohol to produce 2-hydroxy-3,6-dichloro-benzyl alcohol, methylating said 2-hydroxy-3,6 -dichloro-benzyl alcohol at the 2-hydroxy group to produce 2-methoxy-3,6-dichloro-benzyl alcohol, oxidizing said 2-methoxy-3,6-dichloro-benzyl alcohol to produce 2-methoxy-3,6-dichloro-benzoic acid, and recovering said 2-methoxy-3,6-dichloro-benzoic acid.

3,969,405

OXIDATION OF ALKYLAROMATICS

Pierre M.J.G. de Radzitzky d'Ostrowick, 101, Ave. Paul Hymans, and Jacques D. V. Hanotier, 36, Avenue Dr. Decroly, both of Brussels, Belgium

Continuation-in-part of Ser. No. 884,336, Dec. 11, 1969, Pat. No. 3,665,030. This application Apr. 11, 1972, Ser. No. 243,086

The portion of the term of this patent subsequent to May 5, 1989, has been disclaimed.

Claims priority, application France, Sept. 17, 1971, 71.33504

Int. Cl.² C07C *51/33*

U.S. Cl. 260—524 M **15 Claims**

1. The process of oxidizing an alkyl carbocyclic aromatic compound having at least one methyl group directly linked to the aromatic nucleus, to selectively produce an aromatic acid, comprising reacting said alkyl carbocyclic aromatic compound in the liquid phase with a cobaltic salt in the presence of a molar excess with respect to said salt of an activator selected from the group consisting of the acids having a dissociation constant higher than 10^{-3} other than hydrogen halides and which are stable in the conditions of the reaction, boron trifluoride and mixtures thereof, at a temperature between −30°C and +100°C, and under a partial pressure of oxygen between 0.1 to 50 atmospheres.

3,969,406

PROCESS FOR THE PRODUCTION OF CARNITINE

Leander Tenud, Visp, Vs, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed Apr. 28, 1975, Ser. No. 572,316

Claims priority, application Switzerland, Apr. 26, 1974, 5730/74

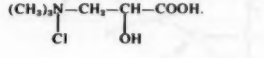
Int. Cl.² C07C *101/30*

U.S. Cl. 260—534 M **9 Claims**

1. The process for the production of carnitine hydrochloride which comprises (*a*) reacting a γ-haloacetoacetanilide having the formula:

$$XCH_2COCH_2CONYC_6H_5$$

where X is a halogen atom and Y is a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, with trimethylamine, a γ-trimethylammonium acetoacetanilide halide resulting, (*b*) hydrogenating said γ-trimethylammonium acetoacetanilide halide, a γ-trimethylammonium-β-hydroxybutyric acid halide resulting, and (*c*) converting said γ-trimethylammonium-β-hydroxybutyric acid halide by means of aqueous hydrochloric acid into said carnitine hydrochloride, which has the formula:



3,969,407

SUBSTITUTED CARBAMOYL SULFINES AND THEIR MANUFACTURE

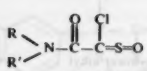
Wendell Gary Phillips, Olivette, and Kenneth Wayne Ratts, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 1, 1971, Ser. No. 194,539

Int. Cl.² C07C *103/12, 103/34*

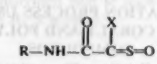
U.S. Cl. 260—561 S **30 Claims**

1. A substituted carbamoyl sulfine of the formula

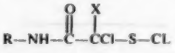


wherein R and R′ are each independently selected from hydrogen, lower alkyl, alkoxyalkyl of from 2 through 8 carbons, benzyl, phenyl, substituted phenyl wherein the ring substituents thereof total from 1 through 3 same or different substituents selected from the group of substituents consisting of lower alkyl, lower alkoxy, halo, nitro, and trihalomethyl, provided that the number of nitro substituents be from 0 through 2, and substituted benzyl wherein the substituents are on the phenyl ring and are as defined for substituted phenyl.

28. A method for the preparation of substituted carbamoyl sulfines of the formula



wherein R is selected from hydrogen, lower alkyl, alkoxyalkyl of from 2 through 8 carbons, benzyl, phenyl, substituted phenyl wherein the ring substituents thereof total from 1 through 3 same or different substituents selected from the group of substituents consisting of lower alkyl, lower alkoxy, halo, nitro, and trihalomethyl, provided that the number of nitro substituents be from 0 through 2, and substituted benzyl wherein the substituents are on the phenyl ring and are as defined for substituted phenyl, and X is chloro or lower alkyl, which comprises reacting at temperatures above the freezing point of the system to about 50°C about one molecular proportion of a chloromethane sulfenyl chloride of the formula



wherein R and X have the aforementioned significance and about two equivalent proportions of an aqueous base selected from the group consisting of alkali metal carbonates and bicarbonates and alkali metal hydroxides of up to 0.1 molar strength.

3,969,408

2-ALKYL-5-OXIMINOCYCLOPENTANONE AND THE METHOD OF PREPARING THE SAME

Hiroyuki Kyomori, Yachiyo; Kazuhiro Sasaki, Fuchu, and Mitsuhiro Takahashi, Tokyo, all of Japan, assignors to Kobayashi Perfumery Co., Ltd., Tokyo, Japan

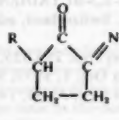
Filed Dec. 18, 1974, Ser. No. 533,792

Claims priority, application Japan, Mar. 5, 1974, 49-25518

Int. Cl.² C07C *131/02*

U.S. Cl. 260—566 A **5 Claims**

1. 2-alkyl-5-oximinocyclopentanone useful as perfume raw material, the chemical structure of which may be expressed by the general formula:



where R is a lower alkyl group.

3,969,409

3-ANILINO-5,5-DISUBSTITUTED-2-AMINOMETHYL-2-CYCLOHEXEN-1-ONES AND THE SALTS THEREOF

Seiji Miyano, and Nobuhiro Abe, both of Fukuoka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

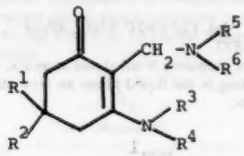
Filed Apr. 24, 1973, Ser. No. 354,139

Claims priority, application Japan, May 11, 1972, 47-47047; Dec. 22, 1972, 47-2613

Int. Cl.² C07C *97/10*

U.S. Cl. 260—570.5 CA **27 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein each of R^1 and R^2 independently represents hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; one of R^3 and R^4 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, or cycloalkyl of up to 6 carbon atoms, and the other represents (a) phenyl, (b) phenyl substituted by a member of the group consisting of alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, halogen, nitro, hydroxy, mono- or di-alkylamino wherein the alkyl is of 1 to 2 carbon atoms, (c) alkyl of 1 to 6 carbon atoms, (d) alkenyl of 2 to 6 carbon atoms, (e) cycloalkyl of up to 6 carbon atoms, (f) benzyl or (g) phenethyl; one of R^5 and R^6 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms or cycloalkyl of up to 6 carbon atoms, and the other represents alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cycloalkyl of up to 6 carbon atoms, phenyl, benzyl or phenethyl, and a pharmaceutically acceptable salt thereof.

3,969,410

1-(2′-ALKYL-3′,4′-DIHYDROXY-PHENYL)-2-(PHENYLALKYL-AMINO)-ALKANOLS-(1) AND SALTS THEREOF

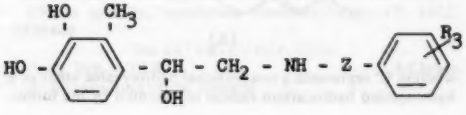
Anton Mentrup; Kurt Schromm; Otto Thomä, and Karl Zeile, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 217,291, Jan. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 713,265, Oct. 16, 1967, Pat. No. 3,657,244. This application July 3, 1974, Ser. No. 485,348

Int. Cl.² C07C *91/22;* **C07D** *473/00*

U.S. Cl. 260—570.6 **6 Claims**

1. A racemic mixture of a compound of the formula



wherein

Z is alkylene of 2 to 5 carbon atoms, and

R_3 is hydrogen or hydroxyl,

a pure stereoisomer thereof; a diastereomeric antipode pair thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture, stereoisomer or diastereomeric antipode pair.

3,969,411

PROCESS FOR N-ALKYLATING AROMATIC AMINES

Joachim Schneider, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

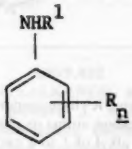
Filed Sept. 11, 1974, Ser. No. 505,115

Claims priority, application Germany, Sept. 28, 1973, 2348738

Int. Cl.² C07C *87/50, 87/54*

U.S. Cl. 260—577 **7 Claims**

1. Process for preparing N-alkylated aromatic amines which comprises heating in the liquid phase an aromatic amine having the formula:



wherein

R is selected from the group of halogen, lower alkyl, alkoxy, alkylmercapto and phenyl optionally substituted by lower alkyl, alkoxy and alkylmercapto;

R^1 is selected from the group of hydrogen, lower alkyl, phenyl and aminophenyl optionally substituted by lower alkyl, alkoxy and arylmercapto; and

n is 0, 1, 2 or 3

together with a lower aliphatic alcohol in the presence of from 0.01 to 1.0 mol of phosphoric acid per nitrogen equivalent at a temperature in the range of from 150° to 280°C, obtaining at least two liquid phases including a lower phase which contains said phosphoric acid and thereafter separating the liquid phases formed to isolate the N-alkylated aromatic amine.

3,969,412

16,17-SECO-DELTA 4,9(10) AND -DELTA 4,9(10),11 STEROIDS

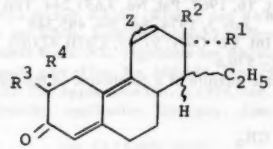
Pierre Crabbe, Mexico City, Mexico; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 440,328, Feb. 7, 1974, abandoned, which is a division of Ser. No. 142,762, May 12, 1971, Pat. No. 3,819,686. This application Nov. 22, 1974, Ser. No. 526,359

Int. Cl.² C07C *49/48*

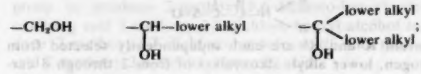
U.S. Cl. 260—586 E **8 Claims**

1. A compound selected from the group of compounds represented by the following formula:



(A)

wherein R^1 represents a conventional hydrolyzable ether of a hydroxylated hydrocarbon radical represented by the formulas:



R^2 is lower alkyl;

R^3 and R^4 are hydrogen or methyl, provided that R^4 is methyl when R^3 is methyl; and

Z is a carbon-carbon single bond or a carbon-carbon double bond.

3,969,413

HYDROFORMYLATION PROCESS USING CATALYST COMPRISING COBALT AND POLYNITROARYL COMPOUNDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 20, 1975, Ser. No. 542,739

Int. Cl.² C07C *27/22*

U.S. Cl. 260—604 HF **17 Claims**

1. A process for the preparation of hydroformylation products which comprises hydroformylating an olefin possessing from 3 to 20 carbon atoms with carbon monoxide and hydrogen in the presence of a catalyst comprising a polynitroaryl which may be substituted by a lower alkyl, amino, halo, hydroxy, carboxy or hydrazino radical and a cobalt-containing compound at a temperature in the range of about 75° to 300°C and a pressure of 20 atmospheres to 500 atmospheres and recovering the resultant hydroformylation products.

3,969,414

NAPHTHYLMETHYL SULFONIUM COMPOUNDS

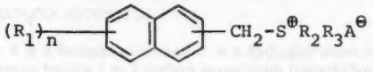
Wayne W. Frenier, and William J. Settineri, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 350,295, April 11, 1973. This application Feb. 18, 1975, Ser. No. 550,401

Int. Cl.² C07C *149/46*

U.S. Cl. 260—607 B **11 Claims**

1. A compound corresponding to the formula



wherein *n* is 1 or 2; each R_1 independently is a hydrocarbyl, hydrocarbyloxy or hydrocarbylthio group of from 1 to about 24 carbon atoms, or a hydrocarbyl group of from 1 to about 24 carbon atoms whose chain length is interrupted by an atom of oxygen or sulfur; R_2 is a hydrocarbyl radical of from 1 to about 24 carbon atoms, with the proviso that the total carbon content of R_1 and R_2 is from 7 to about 25 carbon atoms; R_3 is an alkyl radical of from 1 to 4 carbon atoms, allyl or a phenyl radical; and A^- is a neutralizing anion.

3,969,415

1-(2-NAPHTHYL)-2,3-BUTADIEN-1-OLS

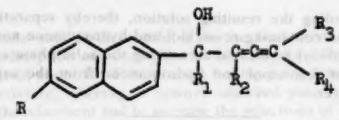
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 203,825, Dec. 1, 1971, abandoned. This application Oct. 1, 1973, Ser. No. 402,468

Int. Cl.² C07C *43/20, 33/06, 149/00*

U.S. Cl. 260—613 D **14 Claims**

1. A compound of the formula



wherein

R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms or difluoromethoxy;

R_1 is hydrogen or alkyl of 1 to 3 carbon atoms;

R_2 is hydrogen or methyl; and

R_3 and R_4 are, independently, hydrogen or alkyl of 1 to 3 carbon atoms provided that at least one of R_3 and R_4 is hydrogen when R_2 is methyl.

3,969,416

PREPARATION OF KETALS

Peter Sylvester Shaw, Cross Farm, Orton Rigg, Great Orton, Cumberland, England

Continuation of Ser. No. 249,837, May 3, 1972, abandoned. This application May 9, 1974, Ser. No. 469,011

Claims priority, application United Kingdom, May 4, 1971, 12869/71

Int. Cl.² C07C *41/10*, *41/06*

U.S. Cl. 260—615 A **7 Claims**

1. A process for the preparation of a ketal of the formula

(I)

wherein

R^1 is alkyl of 1 to 4 carbon atoms,

R^2 is a primaru or secondary alkyl group of 1 to 4 carbon atoms,

R^3 is methyl and

R^4 is methyl,

which comprises reacting an unsaturated compound of the formula

(II)

wherein R^1 and R^2 are as defined above and X is a primary or secondary alkylidene group of 1 to 4 carbon atoms, with methanol in the presence of an inert solvent and a sulphonic acid ion exchange resin in the acid form as catalyst, at a temperature of 10°–60°C.

3,969,417

PROCESS FOR THE ALKOXYLATION OF COMPOUNDS CONTAINING ALCOHOLIC HYDROXYL GROUPS

Wilfried Umbach, Langenfeld, and Werner Stein, Erkrath-Unterbach, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

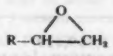
Continuation of Ser. No. 293,425, Sept. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 859,581, Sept. 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 683,446, Nov. 16, 1967, abandoned. This application Apr. 3, 1975, Ser. No. 564,811

Claims priority, application Germany, May 16, 1967, 6274212; Nov. 8, 1968, 1807780

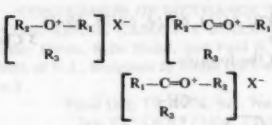
Int. Cl.² C07C *41/02*, *41/10*

U.S. Cl. 260—615 B **16 Claims**

1. A process for alkoxylation of compounds containing an alcoholic hydroxyl group which compises reacting a secondary alkanol having from 8 to 15 carbon atoms with an epoxide of the formula



wherein R is a member selected from the group consisting of hydrogen, alkyl having 1 to 2 carbon atoms, hydroxyalkyl having 1 to 2 carbon atoms and haloalkyl having 1 to 2 carbon atoms, under alkoxylation conditions at temperatures between 0° and 200°C in the presence of from 0.05 % to 5% by weight, based on the weight of said compound containing hydroxyl groups, of a tertiary oxonium salt of the formula



wherein X represents a halogeno-complex anion selected from the group consisting of BF_4^-, $FeCl_4^-$, $AlCl_4^-$, $SbCl_6^-$ and $SnCl_6^=$; R_1 represents a member selected from the group consisting of alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, haloalkyl having from 1 to 4 carbon atoms and phenyl; R_2 and R_3 are members selected from the group consisting of alkyl having 1 to 24 carbon atoms, alkoxy having from 1 to 4 carbon atoms, haloalkyl having 1 1 to 4 carbon atoms, phenyl, phenylvinyl and when taken together, alkylene having 3 to 14 carbon atoms, oxaalkylene having 2 to 13 carbon atoms, thiaalkylene having 2 to 13 carbon atoms, azaalkylene having 2 to 13 carbon atoms, alkenylene having 3 to 14 carbon atoms, alkadienylene having 4 to 14 carbon atoms and benzobutadienylene; and recovering said alkoxylated compounds.

3,969,418

(4-BIPHENYLYL)-BUTENOLS

Helmut Teufel; Wolfhard Engel, and Ernst Seeger, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

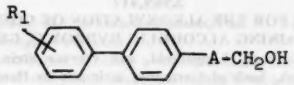
Continuation-in-part of Ser. No. 387,802, Aug. 13, 1973, Pat. No. 3,859,256. This application July 3, 1974, Ser. No. 485,574

Claims priority, application Germany, Aug. 17, 1972, 2240440

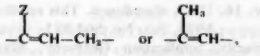
Int. Cl.² C07C *31/14*, *31/34*

U.S. Cl. 260—618 R **4 Claims**

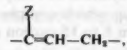
1. A compound of the formula



wherein A is



where Z is hydrogen or methyl, and
R_1 is halogen or, when A is



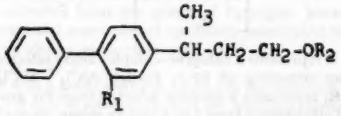
also hydrogen.

3,969,419
3-(2-HALO-4-BIPHENYLYL)-1-BUTANOLS AND DERIVATIVES THEREOF

Wolfhard Engel; Helmut Teufel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhine, Germany

Filed Aug. 15, 1974, Ser. No. 497,716
Claims priority, application Germany, Aug. 16, 1973, 2341506
Int. Cl.² C07C *31/14, 69/14, 69/78, 69/24*
U.S. Cl. 260—618 D **3 Claims**

1. A compound of the formula



wherein R_1 is chlorine or fluorine, and
R_2 is hydrogen, alkanoyl of 1 to 10 carbon atoms or benzoyl.

3,969,420
PROCESS FOR RECOVERING RESORCINOL AND HYDROQUINONE IN MIXTURE

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumi-otsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 2, 1973, Ser. No. 375,920
Claims priority, application Japan, July 5, 1972, 47-67840
Int. Cl. C07c *37/24*
U.S. Cl. 260—621 A **9 Claims**

1. A process for recovering resorcinol and hydroquinone in mixture from a solution resulting from the acid catalyzed cleavage of the resulting oxidation products of the liquid phase, oxygen or oxygen containing gas oxidation of diisopropylbenzene and successive distillation of the cleavage products to remove lower and higher boiling components, which comprises adding to said solution a mixed organic solvent of (1) at least one hydrocarbon solvent selected from the group consisting of alkanes having 7 to 10 carbon atoms, benzene and lower alkyl substituted benzene and (2) at least one compound selected from the group consisting of acetone, methylethylketone, methylisopropylketone, methylisobutylketone, methanol, ethanol, isopropanol, tert.-butanol, methyl acetate and ethyl acetate, dissolving the resulting mixture by heating, slowly cooling the resulting solution, thereby separating a solid phase containing resorcinol and hydroquinone and the organic solvent layer, and recovering the solid phase of the mixture of resorcinol and hydroquinone from the organic solvent layer.

3,969,421
PROCESS FOR PRODUCING ETHYLPHENOLS

Pierre Marie Joseph Ghislain de Radzitzky d'Ostrowick, Woluwe-St.-Lambert, and Philippe Jean André Camerman, Wezembeek-Oppem, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,447
Claims priority, application Belgium, Feb. 21, 1974, 141219
Int. Cl.² C07C *39/06*
U.S. Cl. 260—621 C **7 Claims**

1. In a process for producing ethylphenol comprising the steps of reacting in liquid phase, diethylbenzene with a molecular oxygen containing gas, at a temperature between 100° and 180°C, until 5 to 30% of the diethylbenzene feed is converted into diethylbenzene hydroperoxide, withdrawing the reaction mixture, evaporating the unconverted diethylbenzene therefrom to obtain a concentrate containing at least 40% of diethylbenzene hydroperoxide, and recycling the unconverted diethylbenzene to the oxidation stage, mixing the diethylbenzene hydroperoxide concentrate with a solvent selected from the group consisting of lower alkanols, lower alkanones and mixtures thereof, decomposing said hydroperoxide by intimately contacting the mixture of diethylbenzene hydroperoxide and solvent with a strong acid which is used in an amount of between 0.05 and 5% of the weight of total reaction mixture, neutralizing the resulting mixture and thereafter distilling the neutralized mixture to recover a bottom fraction containing ethylphenol and an overhead fraction containing acetaldehyde, the improvement which comprises the further steps of treating said ethylphenol fraction with a compound reactive to the ketones within said fraction, said compound being selected from the group consisting of hydrazine, hydrazine hydrate, the substitution derivatives of hydrazine, aminoguanidine, the substitution derivatives of aminoguanidine, hydroxylamine, semicarbazide, 4-aryl-semicarbazides, thiosemicarbazides, 4-aryl-thiosemicarbazides, and mixtures thereof and thereafter distilling such treated fraction to obtain ethylphenol substantially free of ketonic impurities.

3,969,422
PROCESS FOR THE SEPARATION OF CRESOL ISOMERS

Richard W. Neuzil, Downers Grove, and Donald H. Rosback, Elmhurst, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 367,685, June 6, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,456
Int. Cl.² C07C *39/06, 37/24*
U.S. Cl. 260—621 B **25 Claims**

1. A process for separating para-cresol from a feed mixture containing para-cresol and at least one other cresol isomer which process comprises the steps of:

a. contacting, at adsorption conditions including a temperature of from about 100° F. to about 500° F. and a pressure of from about atmospheric to about 500 psig., said feed mixture with an adsorbent comprising a crystalline aluminosilicate selected from the group consisting of X structured and Y structured zeolites containing at the exchangeable cationic sites one or more selected cations, thereby selectively adsorbing para-cresol;
b. withdrawing from the adsorbent a raffinate stream comprising less selectively adsorbed cresol isomers;
c. thereafter contacting said adsorbent at adsorption conditions including a temperature of from about 100° F. to about 500° F. and a pressure from about atmospheric to about 500 psig. with a desorbent material comprising a saturated alcohol of from 1 to 7 carbon atoms per mole-

cule and which is soluble in the feed mixture at said adsorption and desorption conditions and differing by at least about 15° F. in average boiling point from the feed mixture, whereby to remove adsorbed para-cresol from the adsorbent and to increase the selectivity of the adsorbent for para-cresol in subsequent contact of the feed mixture with the adsorbent;

d. withdrawing from the adsorbent an extract stream containing desorbed para-cresol; and

e. contacting an additional quantity of said feed mixture with the resultant adsorbent of increased selectivity for para-cresol.

3,969,423

CONTINUOUS PREPARATION OF 2,4,4,4-TETRACHLOROBUTANOL

Neal E. Morganson, Lake Charles, La., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 372,178, June 21, 1973, abandoned. This application June 25, 1975, Ser. No. 590,181

Int. Cl.² C07C *31/34*

U.S. Cl. 260—633 **11 Claims**

1. In a continuous process for preparing 2,4,4,4-tetrachlorobutanol which comprises reacting allyl alcohol with carbon tetrachloride at a temperature of about 70°–95°C, the improvement of carrying out the reaction in the presence of a catalyst system comprised of catalytic proportions of carbon dioxide and an iron-containing material selected from the group consisting of iron powder, ferrous chloride and a mixture thereof, said catalytic proportion of carbon dioxide being in the range of about 0.001 to about 1.2 moles per each mole of said allyl alcohol, said catalytic proportion of iron powder being in the range of about 0.5 to about 12 parts per every 100 parts by weight of said allyl alcohol, and said catalytic proportion of ferrous chloride being in the range of about 1 to about 14 parts per every 100 parts by weight of said allyl alcohol.

3,969,424

PROCESS FOR OXYCHLORINATION OF HYDROCARBONS

Jean-Claude Daumas, Marly-le-Roi, and Madeleine Le Page, Paris, both of France, assignors to Rhone-Progil, Paris, France

Division of Ser. No. 226,929, Feb. 16, 1972, Pat. No. 3,849,338. This application Sept. 3, 1974, Ser. No. 502,804

Int. Cl.² C07C *17/10*, *17/15*

U.S. Cl. 260—662 A **17 Claims**

1. In the process for the oxyclorination of hydrocarbons wherein a mixture of a lower aliphatic hydrocarbon, hydrogen chloride and a molecular oxygen-containing gas are reacted to produce chlorinated hydrocarbons, the improvement comprising carrying out the reaction in the presence of a catalyst consisting essentially of copper chloride deposited on a support of silica and magnesia prepared by calcining at a temperature within the range of 530° to 700°C bodies of a silica hydrogel containing a compound selected from the group consisting of magnesium chloride, magnesium bromide, magnesium perchlorate and mixtures thereof, with the hydrogel containing 10 to 25% by weight of magnesia based on the calcined particles.

3,969,425

SATURATED HYDROCARBON ISOMERIZATION PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 445,019, Feb. 22, 1974, Pat. No. 3,919,340, which is a continuation-in-part of Ser. No. 365,782, May 31, 1973, Pat. No. 3,839,193, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Mar. 5, 1975, Ser. No. 555,497 The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.

Int. Cl.² C07C *5/26*

U.S. Cl. 260—666 R **17 Claims**

1. A process for isomerizing an isomerizable saturated hydrocarbon which comprises contacting said saturated hydrocarbon at isomerization conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 weight percent platinum or palladium, about 0.01 to about 2 weight percent iridium, about 0.01 to about 5 weight percent germanium and about 0.1 to about 3.5 weight percent halogen, wherein the platinum or palladium, iridium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum or palladium and iridium are present in the corresponding elemental metallic states and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal.

3,969,426

CONVERSION OF METHANOL TO PRODUCTS COMPRISING GASOLINE BOILING COMPONENTS

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,733

Int. Cl.² C07C *15/04*, *15/06*, *1/20*

U.S. Cl. 260—668 R **15 Claims**

1. In a process for converting methanol by contacting the same over a crystalline zeolite conversion catalyst at elevated temperature, the improvement which comprises passing a methanol-containing charge in contact with said crystalline zeolite conversion catalyst in a conversion zone maintained at a temperature within the range of about 900° to about 1200°F for a reactant to catalyst contact time within the range of 0.5 to 5 seconds to produce an aliphatic product enhancing the front end octane level of gasoline boiling range material, passing another portion of a methanol-containing charge in contact with a crystalline aluminosilicate conversion catalyst in a conversion zone maintained at a temperature within the range of about 500° to about 900°F for a reactant to catalyst contact time within the range of from 10 to 60 seconds so as to provide highly aromatic products boiling in the gasoline boiling range and recovering a product of each of said methanol conversion operations as a combined product of improved octane value over the entire boiling range of gasoline boiling range material.

3,969,427

CONVERSION OF ALCOHOLS AND/OR ETHERS TO HYDROCARBONS

Weldon K. Bell, Pennington, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 535,053

Int. Cl.² C07C *9/02*, *9/14*

U.S. Cl. 260—676 R **3 Claims**

1. In the process of converting a feed of at least one member selected from the group consisting of lower organic alkyl alcohols, ethers, and halides to conjunct hydrocarbon mixtures by bubbling a substantial amount of said feed as a vapor through a molten salt comprising zinc chloride at about 570 to 750°F; the improvement which comprises cofeeding hydro-

gen in a proportion of about 180 to 3600 SCF per pound mol of feed at a pressure of about 0 to 1500 psig into admixture with said vapor and passing said admixture through said molten salt.

3,969,428

PROCESS FOR THE PRODUCTION OF CONJUGATED DIOLEFINS

Toshio Ishikawa; Takashi Hayakawa, both of Tokyo; Tsutomu Nishimura, Koganei; Michio Araki, Mitaka, and Katsuomi Takehira, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 11, 1974, Ser. No. 513,959
Claims priority, application Japan, Nov. 5, 1973, 48-124139
Int. Cl.² C07C 5/48
U.S. Cl. 260—680 E **5 Claims**

1. A process for the production of conjugated diolefins having 4–6 carbon atoms from the corresponding monoolefins which comprises oxidatively dehydrogenating monoolefins having 4–6 carbon atoms in the vapor phase in the presence of molecular oxygen at a temperature of 300°–600°C, characterized in that said monoolefins are brought into contact with a catalyst consisting essentially of oxides of molybdenum, arsenic and an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium and barium and represented by the empirical formula:

$$Mo_aMe_bAs_cO_d$$

wherein Me stands for said alkaline earth metal, a is 1, b is 0.1–1, c is 0.1–1 and d stands for the number of oxygen atoms which satisfy the valence of the metals in the oxidized state.

3,969,429

METHOD OF PRODUCING BUTENE-1

Gennady Petrovich Belov, p/o Chernogolovka, ulitsa Pervaya, 5, kv. 15; Talmuraz Savelievich Dzhabiev, p/o Chernogolovka, ulitsa Pervaya, 31, kv. 41; Fridrikh Stepanovich Dyachkovsky, p/o Chernogolovka, ulitsa Tretya, 3, kv. 2; Vyacheslav Ivanovich Smirnov, p/o Chernogolovka, ulitsa Tretya, 1, kv. 19; Nelli Dzhavkharovna Karpova, p/o Chernogolovka, ulitsa Pervaya, 29, kv. 100; Khaim-Mordkhe Aronovich Brikenshtein, p/o Chernogolovka, ulitsa Vtoraya, 5, kv. 1; Matrena Petrovna Gerasina, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 61, all of Moskovskaya oblast, Noginsky raion; Vladimir Evgenievich Kuzmin, ulitsa 50 letiya Oktyabrya, 13/12, kv. 199, Kazan; Petr Evgenievich Matkovsky, p/o Chernogolovka, ulitsa Pervaya, 16, kv. 26, Moskovskaya oblast, Noginsky raion; Ljudmila Nikolaevna Russiyan, p/o Chernogolovka, ulitsa Pervaya, 2a, kv. 41, Moskovskaya oblast, Noginsky raion; Anatoly Dmitrievich Pomogailo, p/o Chernogolovka, ulitsa Pervaya, 33, kv. 15, Moskovskaya oblast, Noginsky raion, all of U.S.S.R.; Nikolai Mikhailovich Chirkov, deceased, late of Moscow, U.S.S.R., and by Mikhail Nikolaevich Chirkov, administrator, ulitsa Vavilova, 55/5, kv. 6, Moscow, U.S.S.R.

Continuation of Ser. No. 494,918, Aug. 5, 1974, abandoned, which is a division of Ser. No. 436,809, Jan. 25, 1974, Pat. No. 3,879,485. This application Sept. 8, 1975, Ser. No. 611,319
Int. Cl.² C07C 3/10
U.S. Cl. 260—683.15 D **2 Claims**

1. A method of producing butene-**metaphenylenediamine**, comprising dimerizing ethylene in the presence of a complex organometallic catalyst consisting of titanium alcoholates of the formula $Ti(OR)_4$ and alkylaluminium of the formula $AlR_2''R'$, where R is an alkyl radical having from 2 to 4 carbon atoms, R′ is either the same as R or is H, R″ is the same as R′, with said catalyst being modified by an additive for decreasing formation of by-products selected from the group consisting of dicyclopentadienyltitanium dichloride, oxygen, methaphenylenediamine, and N-phenyl-β-naphthylamine, and in the medium of a hydrocarbon solvent selected from the group consisting of n-heptane; n-decane, and toluene.

3,969,430

PROCESSABILITY OF INTRACTABLE POLYMERS

Ilmar L. Kalnin, Millington, N.J., and Thaddeus E. Helminiak, Dayton, Ohio, assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,750
Int. Cl.² C08L 79/06, 79/04, 79/00
U.S. Cl. 260—823 **20 Claims**

1. An improved process for forming a three-dimensional shaped article from a normally intractable high temperature resistant polymer comprising:

a. physically admixing in substantially uniform admixture (1) a major quantity of a nitrogenous intractable high temperature resistant polymer which lacks a glass transition temperature below its decomposition temperature and (2) a minor quantity of a cross-linkable additive polymer exhibiting a glass transition temperature above 200°C. and below its decomposition temperature, or precursors capable of forming the same,

b. forming said substantially uniform admixture into a three-dimensional shaped article at a temperature which is below the decomposition temperature of said intractable high temperature resistant polymer, and below the decomposition temperature of said cross-linkable additive polymer, and

c. heating said resulting shaped article until said cross-linkable additive polymer is cross-linked and the thermal stability of said shaped article enhanced.

19. A high temperature resistant pressure molded three-dimensional shaped article having a flexural strength of at least 5,000 psi comprising in substantially uniform admixture (1) about 70 to 95 parts by weight of a nitrogenous intractable high temperature resistant polymer which lacks a glass transition temperature below its decomposition temperature and (2) about 5 to 30 parts by weight of a cross-linked additive polymer exhibiting a glass transition temperature above 200°C.

3,969,431

REINFORCEMENT OF VINYL CHLORIDE RESINS WITH SUSPENSION EMULSION INTERPOLYMERS

Ruth E. Gallagher, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 182,165, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 101,155, Dec. 23, 1970, abandoned. This application Nov. 13, 1973, Ser. No. 415,464
Int. Cl.² C08L 51/06, 27/06, 31/02
U.S. Cl. 260—876 R **9 Claims**

1. A composition comprising an intimate admixture of:

a. a rigid polymer of vinyl chloride; and

b. interpolymer particles which consist essentially of (i) an emulsion acrylate copolymer of 50 to 70% butyl acrylate and 50% to 30% 2-ethylhexyl acrylate which has been crosslinked by from about 0.2% to 10%, by weight of said acrylates, of a monomer containing at least two ethylenically unsaturated groups and (ii) a vinyl chloride polymer which has been suspension polymerized in the presence of said acrylate copolymer and which surrounds and/or is homogeneously dispersed within the mass of said crosslinked acrylate copolymer.

3,969,432

PREPARATION OF POLYMERIC MATERIALS DISINTEGRATABLE BY ULTRAVIOLET LIGHT

Shigenori Togami; Masaharu Okawa, both of Yokohama; Junji Hara, Kamakura, and Masami Tsuruta, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 291,294, Sept. 22, 1972, abandoned. This application June 27, 1974, Ser. No. 483,763

Claims priority, application Japan, Sept. 29, 1971, 46-76180; Jan. 14, 1972, 47-6351

Int. Cl.² C08F 236/10

U.S. Cl. 260—880 R 9 Claims

1. A process which comprises copolymerizing a vinyl aromatic monomer with from 0.5 to 6.0% of a conjugated diene monomer based on the total weight of said monomers, initially copolymerizing said vinyl aromatic monomer by a free radical mechanism with from 15 to 70% by weight of the total quantity of said conjugated diene monomer for from ½ to 6 hours, and then adding the remainder of said conjugated diene to the copolymerization system and continuing the reaction to complete said copolymerization.

3,969,433

IRIDESCENT COMPOSITION AND THE PROCESS OF PREPARING THE SAME

Akira Kose, 11-9, Nukui-kitamachi-3, Koganei, and Tetsuko Kitayama, 40-15, Gohongi-1, Meguro, Tokyo, both of Japan

Filed May 8, 1974, Ser. No. 468,079

Claims priority, application Japan, May 11, 1973, 48-051596

Int. Cl.² C08L 31/02, 25/14

U.S. Cl. 260—885 5 Claims

1. A method of making a stabilized, light reflecting, iridescent polymeric material comprising

a. dispersing dry particles of a polymeric material selected from the group consisting of alkyl esters of methacrylic acid and divinyl benzene; alkyl esters of acrylic acid and divinyl benzene; styrene and divinyl benzene; styrene derivatives and divinyl benzene; alkyl esters of acrylic acid and ethylene glycol dimethacrylate; alkyl esters of methacrylic acid and ethylene glycol dimethacrylate; styrene and styrene derivatives and ethylene glycol dimethacrylate; alkyl esters of acrylic acid and allyl methacrylate; alkyl esters of methacrylic acid and allyl methacrylate; styrene and styrene derivatives and allyl methacrylate in a polymerizable suspending medium comprising an ethylenically unsaturated monomer having a refractive index different from that of the polymeric material and having no measurable solubilizing effect on the polymer particles to form a non-aqueous latex,

1. said non-aqueous latex containing substantially uniform particles having an average particle diameter in the range from about 500 to about 10,000A, the uniformity of the individual particles being such that at least 80% of the mass of particles has a particle size within ± 10% of the average particle size of the entire mass, and

2. said non-aqueous latex particles having an effective volume fraction of from about 0.25 to about 0.74;

b. permitting the non-aqueous latex to stand quietly for a time sufficient to form a three-dimensional, non-contiguous, regularly arranged structure of substantially uniform particles, the particles within the structure having a center to center distance of from about 1500 to about 15,000A, and

c. polymerizing the polymerizable suspending medium surrounding the particles to form a stabilized, light-reflecting, polymeric material exhibiting intense color caused by optical discontinuity.

3,969,434

PROCESS FOR PREPARING IONICALLY CROSSLINKED COPOLYMERS

Richard James Powell, and George Wyatt Prejean, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1973, Ser. No. 410,884

Int. Cl.² C08L 23/08

U.S. Cl. 260—897 B 10 Claims

1. A process for ionically crosslinking at least one first copolymer formed by copolymerizing at least one alpha-olefin of the general formula $RCH=CH_2$ where R is a radical of the class consisting of hydrogen and hydrocarbyl radicals having 1 to 8 carbon atoms and at least one alpha,beta-ethylenically unsaturated carboxylic acid having 1 to 2 carboxylic acid groups and 3 to 8 carbon atoms, the alpha-olefin content of said first copolymer comprising at least 50 mole percent of said first copolymer, the alpha-beta-ethylenically unsaturated carboxylic acid content of said first copolymer comprising 0.2 to 25 mole percent of said first copolymer, which comprises mixing said first copolymer with a cation-supplying blend consisting essentially of 20 to 80 percent by weight of a substantially water-insoluble zinc compound selected from the class consisting of zinc oxide, hydroxide, carbonate and mixtures thereof, 0 to 10 percent by weight of a lubricant and a complemental amount of a second copolymer with a melt index of 50 to 2000 g./10 min. formed by copolymerizing at least one alpha-olefin of the general formula $RCH=CH_2$ where R is a radical of the class consisting of hydrogen and hydrocarbyl radicals having 1 to 8 carbon atoms and at least one alpha,beta-ethylenically unsaturated carboxylic acid, having 1 to 2 carboxylic acid groups and 3 to 8 carbon atoms, the alpha-olefin content of said second copolymer comprising at least 50 mole percent of said second copolymer, the alpha,-beta-ethyleincally unsaturated carboxylic acid content of said second copolymer comprising from 0.2 to 25 mole percent of said second copolymer, at a pressure of 100 to 10,000 p.s.i. and at a temperature above the melting point of both the first and second copolymers and between 100°C. and 330°C., with the amount of the cation-supplying blend present being that amount which has sufficient cations to neutralize at least 10 percent of the carboxylic acid groups in the first and second copolymers and neutralizing at least 10 percent of the carboxylic acid groups in the first and second copolymers, characterized in that there is present during the crosslinking reaction 0.5 to 8 percent by weight, based on the total weight of the cation-supplying blend, of at least one zinc salt of a volatile organic acid.

3,969,435

PROCESS FOR FINISHING TETRAFLUOROETHYLENE-HEXAFLUOROPROPYLENE COPOLYMERS

Charles Eugene Bailey, and Miguel Jacinto Roura, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 3, 1975, Ser. No. 564,901

Int. Cl.² C08L 27/18, 27/20

U.S. Cl. 260—900 8 Claims

1. A process for heat stabilizing copolymers of tetrafluoroethylene and hexafluoropropylene which comprises heating between about 340°C. and about 380°C. for a time sufficient to drive off substantially all volatiles in an atmosphere of air containing between about 3% and about 20% of water vapor, based on weight of atmosphere, a blend of melt-processible copolymers of tetrafluoroethylene and hexafluoropropylene having between about 6.75 and about 27 weight percent hexafluoropropylene, said blend containing:

A. 10–80% by weight of the blend of one or more of said copolymers having a melt viscosity that is:

1. at least 50 percent greater than the melt viscosity desired in the treated blend;

2. no more than five times the melt viscosity desired in the treated blend;
3. at least 13×10^4 poise at 372°C.;

B. 10–80% by weight of the blend of one or more of said copolymers having a melt viscosity that is between 1×10^4 and 5×10^4 poise at 372°C., provided that the melt viscosity is no more than one-half the melt viscosity desired in the treated blend; and

C. 0–33% by weight of the blend of one or more of said copolymers having a melt viscosity of between 5×10^4 and 13×10^4 poise at 372°C.,

wherein the total percent by weight of the blend comprises 100%.

3,969,436
CARRIERS FOR BIOLOGICALLY ACTIVE COMPOUNDS AND METHODS FOR THE PRODUCTION THEREOF

Otto Wichterle, and Jiri Coupek, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 387,313, Aug. 10, 1973, abandoned. This application May 15, 1974, Ser. No. 470,006
Claims priority, application Czechoslovakia, Aug. 18, 1972, 5743-72
Int. Cl.² C08L 33/04
U.S. Cl. 260—901 8 Claims

1. A method for the production of carriers for biologically active compounds comprising the steps of admixing

a. a primary component comprising a three dimensional water insoluble acrylic or methacrylic ester having amino groups which have been diazotized and

b. a secondary component comprising a linear water soluble acrylic or methacrylic ester polymer having ligands selected from the group consisting of aromatic amino groups and aromatic amide groups, for a time sufficient to cause the ligands of the secondary component (b) to form covalent bonds with the primary component (a) by reaction with the diazotized amino groups of the primary component (a)

thereafter killing any unreacted diazotized amino groups remaining from the primary component and then

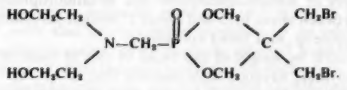
transforming the secondary component (b) ligands on the resulting coupled product of components (a) and (b) into diazonium groups or mercuric salts or isothiocyanate groups so as to obtain carriers operative to bind biologically active compounds.

3,969,437
CYCLIC PHOSPHORUS ESTERS

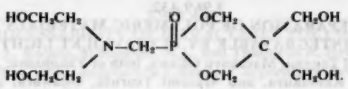
Kyung Sup Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 23, 1971, Ser. No. 118,164
Int. Cl.² C07F 9/40; C08J 9/00
U.S. Cl. 260—937 3 Claims

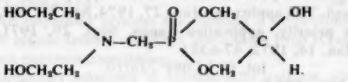
1. The compound:



2. The compound:



3. The compound:

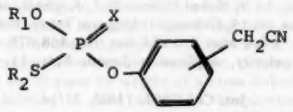


3,969,438
O,S-DIALKYL-O-CYANOMETHYLPHENYLTHIO-PHOSPHATES AND -DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 328,588, Feb. 1, 1973, Pat. No. 3,876,666.
This application Mar. 12, 1975, Ser. No. 557,557
Claims priority, application Switzerland, Feb. 1, 1972, 1498/72; Dec. 29, 1972, 19075/72
Int. Cl.² C07F 9/18
U.S. Cl. 260—940 3 Claims

1. A compound of the formula



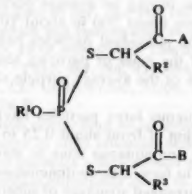
wherein R_1 is methyl or ethly, R_2 is propyl or butyl, and X is oxygen or sulphur.

3,969,439
DITHIOPHOSPHORIC ESTERS

Hans Urbach, Lampertheim, and Heinrich Adolphi, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 1, 1970, Ser. No. 33,884
Claims priority, application Germany, May 7, 1969, 1923269
Int. Cl.² C07F 9/165; A01N 9/36
U.S. Cl. 260—942 2 Claims

1. A dithophosphoric ester having the formula



wherein:

R^1 is methyl or ethyl;

A is $NHCH_3$;

B is $NHCH_3$ or NH_2;

R^2 is hydrogen; and

R^3 is hydrogen or methyl.

3,969,440

PHOSPHORUS CONTAINING GRAFT COPOLYMERIZED ACRYLIC ESTERS AND AMIDES

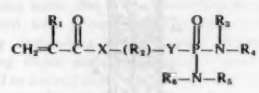
Nathan Allen Edelson, Cynwyd, and Robert W. Faessinger, Media, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 508,724, Sept. 23, 1974, Pat. No. 3,926,872, which is a continuation-in-part of Ser. No. 325,101, Jan. 19, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,413

Int. Cl.[2] C07F 9/02, 9/22

U.S. Cl. 260—944 6 Claims

1. A compound having the general formula:



wherein R_1 is hydrogen or methyl; R_2 is a substituted or unsubstituted lower alkylene group; R_3, R_4, R_5 and R_6 are independently selected from either methyl or ethyl; X is oxygen or —NH— and Y is oxygen or —NH—.

3,969,441

THIOALKYL PHOSPHONATES

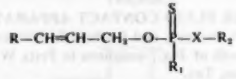
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, which is a division of Ser. No. 123,467, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,906

Int. Cl.[2] C07F 9/40, 9/44; A01N 9/36

U.S. Cl. 260—948 3 Claims

1. Compounds corresponding to the formula



wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is thioalkyl; X is oxygen, sulfur or amino.

3,969,442

O-(2-VINYLPHENYL)-THIOLPHOSPHATES

Manfred Böger, Haltingen, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

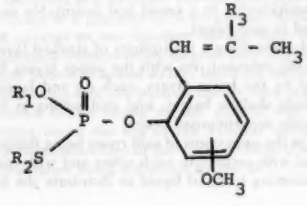
Division of Ser. No. 449,416, March 8, 1974, Pat. No. 3,898,306. This application May 27, 1975, Ser. No. 581,067

Claims priority, application Switzerland, Mar. 15, 1973, 3776/73; Jan. 30, 1974, 1261/74

Int. Cl.[2] C07F 9/16; A01N 9/36

U.S. Cl. 260—951 2 Claims

1. A compound of the formula



wherein R_1 represents methyl or ethyl; R_2 represents n-propyl, isopropyl, isobutyl, sec.butyl or n-amyl; and R_3 represents hydrogen or methyl.

3,969,443

O(S)(NH) TRIFLUOROMETHYL-ARYL PHOSPHONATES

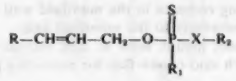
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, Division of Ser. No. 123,497, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,905

Int. Cl.[2] C07F 9/40, 9/44; A01N 9/36

U.S. Cl. 260—955 5 Claims

1. Compounds corresponding to the formula



wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is trifluoromethyl-substituted aryl; X is oxygen, sulfur or amino.

3,969,444

O,S-DIALKYL-O-ALLYLPHENYL-THIOPHOSPHATES AND -DITHIOPHOSPHATES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Jr., Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

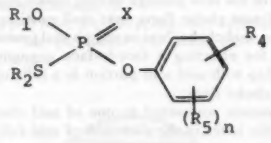
Division of Ser. No. 328,588, Feb. 1, 1973, Pat. No. 3,876,666. This application Mar. 12, 1975, Ser. No. 557,558

Claims priority, application Switzerland, Feb. 1, 1972, 1498/72; Dec. 29, 1972, 19075/72

Int. Cl.[2] A01N 9/36; C07F 9/18

U.S. Cl. 260—956 7 Claims

1. A compound of the formula



wherein R_1 is methyl or ethyl; R_2 is propyl or butyl; R_4 is allyl or methallyl; R_5 is hydrogen, halogen, alkyl of from 1 to 5 carbon atoms, nitro, cyano, methylthio or methoxycarbonyl; n is 1 or 2; and X is oxygen or sulphur.

3,969,445

CARBURETOR HAVING A CHOKE DEVICE

Gustav Vogelsang, Braunschweig, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 3, 1974, Ser. No. 529,111

Claims priority, application Germany, Dec. 6, 1973, 2360859

Int. Cl.[2] F02M 7/22

U.S. Cl. 261—44 R 11 Claims

1. In a carburetor serving an internal combustion engine and including a fuel metering device which has means defining a fuel outlet opening disposed in the zone of the longitudinal axis of the flow passage of an intake manifold having walls defining the flow passage; an arbitrarily actuatable throttle flap situated in the flow passage downstream of the fuel outlet opening; a choke means situated in the flow passage upstream

of the fuel outlet opening for the pressure-dependent setting of the cross-sectional area of the flow passage, the improvement comprising

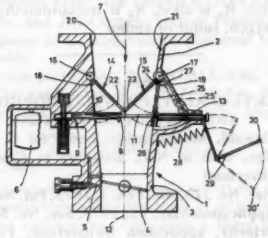
a. two planar, quadrangular choke flaps situated generally side-by-side in said flow passage transversely to the manifold axis; said choke flaps forming part of said choke means and each having

1. a first edge zone extending along the manifold wall in close vicinity thereof; the first edge zones of the one and the other said choke flap being remote with respect to one another;

2. a second edge zone extending generally parallel to said first edge zone; the second edge zones of the one and the other choke flap being adjacent one another and together defining a cross-sectional area of said flow passage;

b. means defining recesses in the manifold wall at opposite locations transversely to the manifold axis;

c. pivotal support means held in said recesses and connected to each said choke flap for providing pivotal motion of each choke flap about a pivotal axis extending in and along said first edge zone of each choke flap; the pivotal axes of the one and the other choke flap being parallel to one another;



d. a manifold wall portion defining a quadrangular cross section of the flow passage of said intake manifold in the zone of said choke flaps, said wall portion closely surrounding said choke flaps in any pivotal position thereof;

e. means for effecting a face-to-face engagment of each choke flap with said wall portion in a fully open position of said choke flaps;

f. spring means connected to one of said choke flaps for urging the latter in the direction of said fully open position; and

g. means for so arranging said choke flaps with respect to one another that in a closed position of said choke flaps the other of said choke flaps overlaps, with its said second edge zone, the second edge zone of said one choke flap for allowing pivotal motion of said one choke flap against the force of said spring means beyond said closed position in response to backlash pressures in said flow passage.

3,969,446

APPARATUS AND METHOD FOR AERATING LIQUIDS

Grover C. Franklin, Jr., 2250 Warmouth St., San Pedro, Calif. 90732

Filed June 3, 1974, Ser. No. 475,829

Int. Cl.[2] C02C *1/10, 1/12, 1/26, 5/04*

U.S. Cl. 261—87 **12 Claims**

11. An aerator for dispersing a gas in a liquid, comprising:

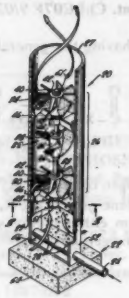
a. a tube having open upper and lower openings, said tube being adapted for a flow of gas and liquid therethrough,

b. means for supporting said tube in a body of liquid with the longitudinal axis of said tube substantially vertical, said tube being submerged in said liquid,

c. a gas supply means connected for delivering a supply of gas bubbles to a lower region of said tube so as to cause an upward flow of gas bubbles and liquid through said tube,

d. rotatable mixing means for breaking said gas bubbles in said tube into a vast number of very small bubbles and for dispersing said very small bubbles in said liquid,

said mixing means comprising plural turbines maintained in mutual spaced relationship within said tube, each of said turbines having an axis of rotation substantially parallel with said longitudinal axis of said tube, at least



two of said turbines being constructed to rotate in opposite directions in response to said upward flow of gas and liquid through said tube, said means being mounted internally to said tube, said means being rotated solely by said upward flow of gas bubbles and liquid through said tube, and

e. venturi means comprising an annular ring mounted internally to said tube adjacent one of said turbines for increasing flow velocity of said gas bubbles and liquid.

3,969,447

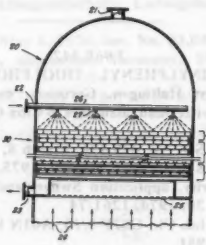
GRIDS FOR FLUID CONTACT APPARATUS

Michael C. Glitsch, Aubrey, and Bedford L. Kitterman, Lakewood Village, both of Tex., assignors to Fritz W. Glitsch & Sons, Inc., Dallas, Tex.

Filed Oct. 18, 1973, Ser. No. 407,585

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—111 **5 Claims**



1. A multi-functional grid system for use in a vapor-liquid contact vessel comprising:

a grid positionable in a vessel and mountable on supports located in said vessel;

said grid comprising a multiplicity of stacked layers of thin vertically oriented ribs with the upper layers being supported by the lower layers, each rib and layer being of relatively shallow height, said grid having at least three vertically superimposed zones;

the ribs in the uppermost of said zones being flange-free and spaced with respect to each other and with respect to a downcoming spray of liquid to distribute the liquid sub-

stantially uniformly across the horizontal extent of said grid and prevent lateral migration of descending liquid as it courses downwardly through said uppermost zone;

at least some ribs in the intermediate of said zones being provided with generally horizontally extending flanges for intercepting descending liquid and forming it into films on said flanges and ribs for contact with ascending vapor, for disentraining liquid being carried upwardly by ascending vapor, and for locally constricting the flow path of ascending vapor to create turbulence therein, the upper surfaces of said flanges being dammed at intervals by thin vertically oriented ribs to substantially prevent lateral migration of liquid therealong, said flanges being substantially coextensive in length with their associated ribs and extending transversely on both sides thereof;

and at least some ribs in the lowermost of said zones being provided with generally horizontally extending flanges having upstanding margins, said flanges and margins forming liquid collecting troughs constructed and arranged to collect descending liquid and convey it laterally of the vessel and along the troughs to liquid gathering means, said flanges and margins being substantially coextensive in length with their associated ribs and extending transversely on both sides thereof.

3,969,448

HEAT EXCHANGERS

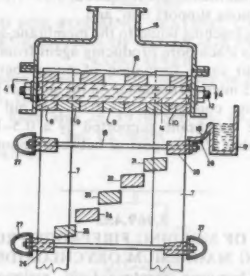
Gerald J. N. Limebeer, Johannesburg, South Africa, assignor to Basil Gilbert Alfred Lund, Johannesburg, South Africa, a part interest

Division of Ser. No. 334,215, Feb. 21, 1973, Pat. No. 3,885,936. This application Dec. 23, 1974, Ser. No. 535,342

Claims priority, application South Africa, Mar. 1, 1972, 72/1381

Int. Cl.² A23C *3/04*; **F28F** *1/02, 13/06*

U.S. Cl. 261—112 **10 Claims**



1. A liquid cooler comprising a multiplicity of tubes extending between tube sheets and means supplying a liquid at an elevated temperature to flow in the tubes and ambient air to flow past the tubes in a direction normal to an aperture plane, the tubes being in a plurality of rows parallel to the aperture plane and parallel to one another, having their longitudinal axes substantially vertical being formed with continuous exterior surfaces from end to end so that there are no heat transfer surfaces extending into the path of the air, and being formed as streamlined bodies facing the air stream, and means for flowing water on to the top of the exterior surfaces of the tubes for a continuous film of the water to form at least on the flanks of the tubes being traversed by the air.

3,969,449

VAPORIZING PROCESS

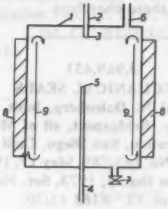
Michael John Shires, and Stephen Frederick Bush, both of Reading, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 26, 1973, Ser. No. 344,598

Claims priority, application United Kingdom, Mar. 29, 1972, 14765/72

Int. Cl.² B01F *3/04*

U.S. Cl. 261—153 **3 Claims**



1. A process for the vapourisation of a heat-sensitive liquid which comprises introducing into an enclosed space

a. the liquid in fine droplet form through an atomising means, and

b. a heated gas at a pressure greater than that in the enclosed space so that the gas circulates and recirculates in the enclosed space past heating means and is further heated, screening the said heating means from the said atomising means and vapourizing the liquid droplets in the part of the enclosed space screened from the heating means by the heated inlet gas and the further heated recirculating gas and removing the vapour from the enclosed space.

3,969,450

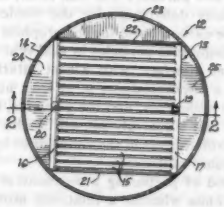
HEAT-EXCHANGER TRAYS AND SYSTEM USING SAME

Robert J. Hengstebeck, Valparaiso, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,524

Int. Cl.² B01D *3/14*; **B01F** *3/04*

U.S. Cl. 261—153 **29 Claims**



1. A heat-exchanger tray for a distillation column, said heat-exchanger tray being hollow and constructed:

to provide a pair of horizontal manifolds at opposite margins;

to provide within the portion of said tray between said manifolds a number of walls to form a number of spaced chambers communicating said pair of manifolds with each other; and

to have vertical openings in said tray between those of said walls that provide adjacent chambers of said chambers,

said walls between adjacent chambers being spaced from each other so that said vertical openings between said spaced walls is such that when said tray is installed and used as a distillation

tray in a distillation column a pool of down-flowing liquid is formed above the entire area of said portion of said tray between said pair of manifolds and that pool of liquid is supported on that portion of said tray primarily by said walls forming said chambers while up-flowing vapor can pass through said openings, and each of said manifolds having an opening for passage of fluid to or from said tray so that fluid can pass from one of said manifolds through said chambers in said portion of said tray between said pair of manifolds to the other of said manifolds with indirect heat exchange of the up-flowing vapor and pool of down-flowing liquid with the fluid flowing through these chambers.

3,969,451

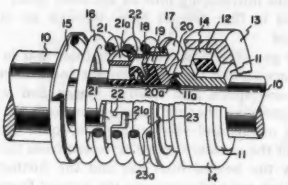
MECHANICAL SEALS

James R. Floyd; Paul N. Dalenberg, both of Saginaw, and Robert B. Slivensky, Bridgeport, all of Mich., assignors to The Wickes Corporation, San Diego, Calif.

Continuation of Ser. No. 143,789, May 17, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,186

Int. Cl.[2] F16J *15/50*

U.S. Cl. 264—29 **19 Claims**



1. In a method of preparing a mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting sealing interfaces to seal off a fluid which wets the interface and wherein the seal comprises a graphitic matrix bonded by a binder; the steps of: homogeneously dispersing non-abrasive particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and particles, to form a seal having said particles in said seal interface; and matching the seal interface with a seat interface, the seat interface having a microhardness of at least about 200 kilograms per square millimeter; and the particles, being of a size and shape to be non-abrasively smooth to the seat interface and having a microhardness in the range of at least about 200 kilograms per square millimeter.

17. In a method of preparing a mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting sealing interfaces to seal off a fluid which wets the interface and wherein the seal comprises a graphitic matrix bonded by a binder; the steps of homogeneously dispersing carbide forming particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and to form dispersed carbide particles in situ in said matrix at said seal interface; and matching the seal interface with a seat interface, the seat interface having a microhardness of at least about 200 kilograms per square millimeter; and the particles being of a size and shape to be non-abrasively smooth to the seat interface and having a microhardness in the range of at least about 200 kilograms per square millimeter.

3,969,452

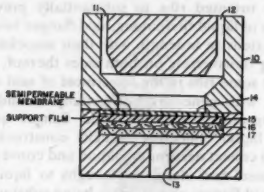
METHOD FOR CASTING AND HANDLING ULTRA-THIN REVERSE OSMOSIS MEMBRANES

David F. Ciliberti, and Luciano C. Scala, both of Murrysville, Pa., assignors to The United States of America as represented by the Secretary of the Department of the Interior, Washington, D.C.

Filed Aug. 8, 1974, Ser. No. 495,758

Int. Cl.[2] B29D *27/04;* **B29C** *1/06;* **B01D** *13/00, 39/16*

U.S. Cl. 264—41 **19 Claims**



1. A method of casting ultra-thin semipermeable membranes on a water soluble film support comprising the steps of:

A. applying a coating of a solution of a film forming water soluble polymer which is not substantially degraded by organic polar solvents, onto a smooth casting surface, wherein the solution contains between about 5–50 wt% solids and about 1.5–5 wt% of a leachable pore producing agent having a water solubility of at least 50 gr/100 gr water,

B. drying the coating at between about 25°–125°C to form a water soluble, continuous support film of up to about 5% porosity about 0.5–10 mils thick on the casting surface,

C. applying a coating of an organic, polymeric, membrane casting solution onto the support film and drying the coating for between 15 seconds to **48** hours at between about 20° to about 200°C to form a semipermeable reverse osmosis membrane film about 0.01–1.0 mil thick on the continuous support film, and

D. applying a leaching liquid to the membrane-support films effective to leach pore producing agent from the support film and to cause formation of pores, between about 0.025–0.25 microns diameter, in the support film; to form a composite consisting of a 0.01–1.0 mil thick semipermeable membrane supported by a 0.5–10 mil thick water soluble film support of between about 5–50% porosity.

3,969,453

METHOD OF MOLDING FIREPROOF PRODUCTS CONTAINING MAGNESIUM OXYCHLORIDE CEMENT

Henry Clark Thompson, Saratoga, Calif., assignor to Thompson Chemicals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 194,557, Nov. 1, 1971, Pat. No. 3,778,304, which is a continuation-in-part of Ser. No. 811,616, March 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 589,808, Oct. 27, 1966, abandoned. This application Sept. 17, 1973, Ser. No. 397,834

Int. Cl.[2] B29H *7/20*

U.S. Cl. 264—42 **5 Claims**

1. A method of preparing a fireproof material comprising the steps of forming a frothing, unset mixture of foamed magnesium oxychloride cement foamed by mixing aqueous magnesium chloride having a specific gravity of between 21.5° and 22.5° Baume with between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride and a metallic frothing agent chemically reactive with said mixture to produce bubbles, adding a heat-degradable component, and setting the mixture in a mold.

3,969,454

METHOD OF MAKING COLORED PARTICLEBOARD

William Thornber, and Brian Wrangham, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 10, 1971, Ser. No. 206,769
Int. Cl.² D01F 1/04
U.S. Cl. 264—78 2 Claims

1. A method of making decorative colored particleboard comprising:

a. coloring wood flakes, having a thickness of from 0.01 to 0.035 inches, with a water soluble dyestuff such that the individual flakes are colored non-uniformly with a relatively densely colored surface and relatively lightly colored core;

b. mixing the wood flakes with an adhesive binder and forming a mattress therewith;

c. hot-pressing the mattress to compact said mattress and to set the adhesive binder thereby forming particleboard; and

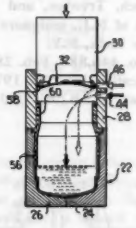
d. sanding a surface of the particleboard to provide a decorative marbled surface.

3,969,455

METHOD FOR FORMING, SEALING, CAPPING AND PASTEURIZATION OF BEVERAGE IN PLASTIC CONTAINER

Jens L. Moller, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 25, 1970, Ser. No. 40,302
Int. Cl.² B29C 17/07
U.S. Cl. 264—89 15 Claims



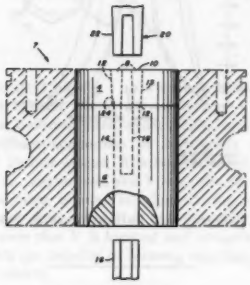
1. A method of forming a container comprising the steps of providing a mold cavity adapted to receive a heated plastic blank, enclosing an area outwardly of the mold cavity after the blank has been inserted therein, supporting a closure within the area prior to the formation of the blank into an open ended container, introducing fluid under pressure into the area thereby forming the blank to the configuration of the mold cavity to form an open ended container therein while the blank still retains sufficient heat to remain in a plastic state, and thereafter securing a peripheral edge of the closure to the container thereby closing the latter.

3,969,456

METHOD FOR MAKING C-SHAPED MAGNETIZABLE CORE

Richard B. Graf; Edward H. Chant, Jr., both of Marengo, and John F. Marco, Woodstock, all of Ill., assignors to Arnold Engineering Company, Marengo, Ill.

Division of Ser. No. 820,815, May 1, 1969, Pat. No. 3,566,323.
This application Feb. 22, 1971, Ser. No. 117,809
Int. Cl.² B22F 5/00
U.S. Cl. 264—111 4 Claims



1. The method for making a C-shaped core with a trapezoidal cross section of magnetizable powdered material and with high permeability comprising:

A. arranging a C-shaped mold having ends and a cavity and said trapezoidal cross section having two parallel sides with one parallel side larger and the other parallel side smaller, said mold having the ends corresponding to the parallel sides of the trapezoid open and having a ram movable into the mold cavity through the larger open end and an ejector movable into the mold cavity through the smaller open end, with the larger open end facing upward and the smaller open end closed by positioning the ejector in the smaller opening but not extending substantially into the mold cavity,

B. placing a predetermined amount of the magnetizable powdered material into the mold cavity,

C. inserting the ram into the mold cavity with sufficient force to compress the powdered material and to bond it into an integral structure of uniform density,

D. withdrawing the ram and inserting the ejector into the mold cavity with sufficient force to eject the resultant integral structure, whereby pressure on all portions of the nonparallel faces of the integral structure is released uniformly, and said integral structure expands uniformly in all directions.

3,969,457

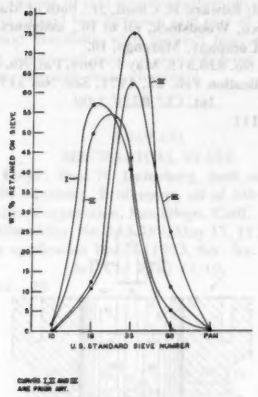
CARBON BLACK PELLETING

Bobby J. Paris, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1971, Ser. No. 204,019
Int. Cl.² B01J 2/12
U.S. Cl. 264—117 3 Claims

1. A method of pelleting carbon black which comprises introducing carbon black and an aqueous solution comprising

from about 1 to about 2 weight percent lignosulfonate and from about 4.5 to about 6.5 weight percent HNO_3 into a



pelleter, and pelleting said carbon black in contact with said solution.

3,969,458

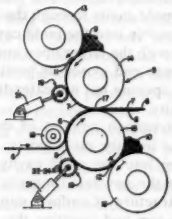
PRICKER ROLL

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 354,575, April 26, 1973, Pat. No. 3,891,494. This application Feb. 3, 1975, Ser. No. 546,247

Int. Cl.² B29H *3/06, 9/02*

U.S. Cl. 264—154 **7 Claims**



1. In a method of calendering tire cords with unvulcanized rubber material which is formed into a sheet prior to contact with tire cords, the improvement comprising: (a) forming a plurality of spaced, transversely extending rows of slots in the sheet of unvulcanized rubber material prior to contact with the tire cords, each row of slots including a plurality of elongated slots spaced end-to-end, each of the slots having a longitudinal axis which is angularly disposed to a longitudinal axis of the sheet of unvulcanized rubber material; (b) staggering the slots of successive rows of slots; and (c) spanning the spaces between successive slots of each row of slots by slots of rows immediately succeeding each row of slots to enable entrapped air to escape from the sheet of unvulcanized rubber material.

3,969,459

FIBERBOARD MANUFACTURE

Henry A. Fremont, Wyoming, and Walter Phalti Lawrence, Hamilton, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed July 18, 1973, Ser. No. 380,334

Int. Cl.² B29J *5/02, 5/08*

U.S. Cl. 264—109 **1 Claim**

1. A process for the manufacture of thin fiberboard products wherein a thermosetting binder-impregnated fiber mat is continuously formed and treated until consolidation and binder cure are completed and the final fiberboard product formed, comprising:

a. passing said binder-impregnated wood fiber mat into a conditioning zone where the mat temperature is adjusted to about the glass transition temperature of the ligneous hemicellulosic matrix material of the wood, about 180° to 210°F., at a moisture content of the mat from about 6% to 12 % by weight;

b. prepressing the conditioned mat at said conditioning temperature and moisture content to reduce the bulk thereof and substantially eliminate entrained air therefrom; and

c. hot pressing the prepressed mat at a temperature and for a time measured in seconds and sufficient to initiate but not to complete cure of the binder, followed by immediately subjecting the mat to a temperature up to about 350°F. for a time, up to about 5 minutes, sufficient to complete binder cure and mat consolidation.

3,969,460

FIBER MAT CURING

Henry A. Fremont, Wyoming, and Walter Phalti Lawrence, Hamilton, both of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed July 18, 1973, Ser. No. 380,353

Int. Cl.² B29J *5/02, 5/08*

U.S. Cl. 264—109 **6 Claims**

1. The method of consolidating and curing a thermosetting binder-impregnated fibrous mat to form a consolidated fiberboard product comprising hot pressing the mat at a temperature of about 400°F. to 550°F. and for about 2 to 10 seconds and sufficient to initiate but not to complete cure of the binder, followed by immediately subjecting the mat to a temperature up to about 350°F. for a time, up to about 5 minutes, sufficient to complete binder cure and mat consolidation.

3,969,461

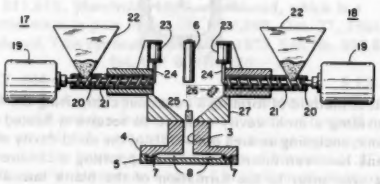
TRANSFER MOLDING THERMOSETTING POLYMERIC MATERIAL

Donald Edward Boesch, Trenton, and Yusuf Taher Kolta, Lawrenceville, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 446,887, Feb. 28, 1974, Pat. No. 3,911,075. This application June 27, 1975, Ser. No. 590,890

Int. Cl.² B29G *3/00*

U.S. Cl. 264—163 **11 Claims**



1. Method of filling a die cavity with a thermosetting poly-

meric first material through a runner from a chamber to produce a molded article, said method comprising:

a. forming a slug adjacent to said chamber said slug consisting of a first body of said first material at one longitudinal end thereof, of a volume at least equal to the volume of the die cavity, and a second body of a second material at the opposite longitudinal end thereof, said first and second bodies having a transversely extending interface intermediate the two longitudinal ends of said slug, by extending said first material and said second material longitudinally toward each other and into engagement with each other at said transversely extending interface, so as to form a combined structure, and cutting off a length of said combined structure including said transversely extending interface;
b. heating said die cavity;
c. introducing said slug into said chamber oriented with respect thereto so that said first body of first material is adjacent to said runner; and
d. pressurizing and deforming said slug in said chamber sufficiently so that said second material forces said first material to flow from said chamber and through said runner so as to fill said die cavity, with at least a portion of said second material flowing from said chamber into said runner.

3,969,462

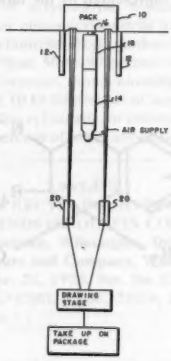
POLYESTER YARN PRODUCTION

Richard H. Stofan, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 160,019, July 6, 1971, Pat. No. 3,858,386. This application Nov. 7, 1974, Ser. No. 521,726

Int. Cl.² B29C *25/00*

U.S. Cl. 264—237 **10 Claims**



1. A method for producing an industrial polyester filament yarn of improved uniformity comprising melt spinning a plurality of filaments at an extrusion temperature above the polymer melting point into a heated zone maintained at a temperature of about 260° to 460°C., and maintaining said filaments in said heated zone for a filament travel distance of about 6 to 24 inches, and hence immediately passing said filaments about a gas quenching zone, directing quenching gas onto said filaments in a radial outflow direction, said quenching gas being maintained at a temperature of 15 to 80°C. in a gas volume of 20 to 130 standard cubic feet per minute being exhausted radially along a distance of about 8 to 20 inches of a peripheral diameter of 1.5 to 4 inches to provide a controlled cooling of said filaments and taking up said filaments as a yarn of improved Uster uniformity.

3,969,463

N-METHYLENE MALONATE OF TETRAHYDROQUINOLINE AND DERIVATIVES THEREOF

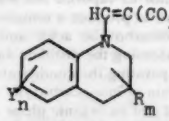
John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,037

Int. Cl.² C07D *215/06, 215/12, 215/14, 215/18*

U.S. Cl. 260—287 T **2 Claims**

1. Compounds of the formula



wherein alk is alkyl having 1 to 4 carbon atoms, Y is alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, acetamido, trifluoroacetamido or N,N-lower dialkylamino having 2 to 8 carbon atoms, R is methyl, ethyl or trifluoromethyl, n is zero, one or two, and Y may also be methylenedioxy or ethylenedioxy bonded to adjacent ring positions, m is zero, one or two, and when R is trifluoromethyl, m is one; provided however that Y is located and comprised such that said compounds are capable of forming substituted benzo[ij]-quinolizine products.

3,969,464

POLYCYCLIC AROMATIC ESTERS OF PGA_1

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,600, Jan. 8, 1974. This application Dec. 12, 1974, Ser. No. 531,990

Int. Cl.² C07G *177/00*

U.S. Cl. 260—395 **3 Claims**

1. The ester of p-tritylphenol and PGA_1.

3,969,465

PROCESS FOR RECOVERY OF CARBOXYLIC ACIDS FROM THE WASTE SALT SOLUTIONS OF CYCLOHEXANONE MANUFACTURE

Josef Klemens Brunner, Scheuchzerstrasse 47, Zurich, Switzerland

Filed Nov. 18, 1974, Ser. No. 524,492

Claims priority, application Australia, Nov. 19, 1973, 9682/73

Int. Cl.² C07C *51/44, 51/48*

U.S. Cl. 260—527 R **4 Claims**

1. In a process for obtaining usefully esterifiable organic acids from the waste solution of salts of monocarboxylic acids having 1 to 6 carbon atoms, dicarboxylic acids and hydroxy carboxylic acids produced in the manufacture of cyclohexanone by the catalytic oxidation of cyclohexane, in which said waste salt solution is acidulated with sulfuric acid to produce an aqueous phase which is a concentrated sulfate salt solution and an organic phase which is a water-containing mixture of free carboxylic acids, said phases are separated and the organic phase is separated by distillation into a distillate containing water and monocarboxylic acids and a residue containing dicarboxylic and hydroxy acids, the improvement which consists in that:

in the acidulation step there is added to the said waste salt solution concentrated sulfuric acid and also an aqueous solution of monocarboxylic acids derived from a separated aqueous phase from the distillate produced in the

distillation step, the acidulation step being performed so as to lower the pH of the salt solution to a value in the range between 1 and 2.5;

the water-containing mixture of carboxylic acids separated as an organic phase from the concentrated sulfate solution is subjected, prior to distillation, to a counter-current extraction with a saturated aqueous solution of monocarboxylic acids obtained as a distillate and retrocycled from the distillation step, the aqueous extract obtained by said counter-current extraction being then recycled to the acidulation step; and

the distillation step is performed on the water-containing carboxylic acid mixture obtained after said counter-current extraction by subjecting it to heat under vacuum in a thin film evaporator to vaporize out water and monocarboxylic acids and to produce a remainder liquid consisting mainly of dicarboxylic acids and one or more hydroxy acids, condensing the distillate vapors to form a condensate, and separating the condensate into an aqueous saturated solution of monocarboxylic acids for retrocycling as aforesaid and an organic phase comprising the monocarboxylic acid product of the process.

3,969,466

PREPARATION OF HYDRAZODICARBONAMIDE

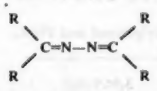
Robert W. Brown, Middlebury; Byron A. Hunter, Woodbridge, and Franklin H. Barrows, Beacon Falls, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,015

Int. Cl.² C07C *133/02*

U.S. Cl. 260—554 **5 Claims**

1. A process for producing hydrazodicarbonamide by heating urea and water, and a ketazine of the formula



wherein the R groups are the same or different and are alkyl groups containing up to 8 carbon atoms or are joined together to form aliphatic rings of 5–6 carbon atoms, to a temperature of about 90° to 130°C. in the absence of an acid catalyst. wherein the urea is present in at least two moles per mole of ketazine.

3,969,467

12-ANTI AND SYN-(N-BENZYL-N-ALKYLAMINOMETHYL)-10,11-DIHYDRO-5,10-METHANO-5H-DIBENZO[a,d]CYCLOHEPTENES AND THE SALTS THEREOF

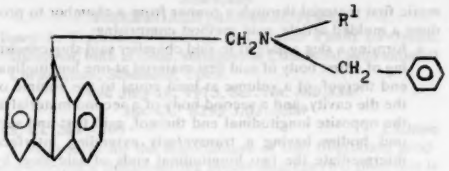
Walton James Hammar, St. Paul, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed May 14, 1973, Ser. No. 360,105

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.9 **2 Claims**

1. A syn and/or anti compound of the formula



wherein R^1 is methyl or ethyl, and acid addition salts thereof.

3,969,468

2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES

Kentaro Tamaki; Kyoichi Fujii; Seiichi Yada, all of Sakai, and Shiro Kudo, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

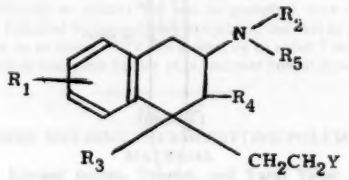
Filed Oct. 29, 1973, Ser. No. 410,443

Claims priority, application Japan, Oct. 31, 1972, 47-108408; Oct. 31, 1972, 47-108409; Oct. 31, 1972, 47-109054

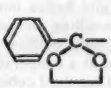
Int. Cl.² C07C *93/14*

U.S. Cl. 260—574 **4 Claims**

1. A compound represented by the formula:



wherein R_1 is a hydrogen atom, a hydroxy group, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a benzyloxy group or an alkanoyloxy group having 1 to 4 carbon atoms; R_2 is a hydrogen atom, an alkyl group having 1 to 8 carbon atoms which is either substituted or unsubstituted, the substituent being a phenyl group, a benzoyl group,



group, =O group or

group, a cycloalky group having 3 to 6 carbon atoms, a cycloalkylalkyl group having 4 to 8 carbon atoms or an alkyenyl group having 3 to 8 carbon atoms which is either substituted or unsubstituted, the substituent being a chlorine atom or a bromine atom; R_3 and R_4 are the same or different and are alkyl groups having 1 to 4 carbon atoms; R_5 is a hydrogen atom or a benzyl group; and Y is an alkoxy group having 1 to 4 carbon atoms, a phenoxy group or a benzyloxy group.

3,969,469

VINYL HALIDE RESIN COMPOSITIONS

Fred E. Love, Denver, Colo., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 362,311, May 21, 1973, Pat. No. 3,922,320. This application Jan. 6, 1975, Ser. No. 538,614

Int. Cl.² C08L *27/06, 33/20*

U.S. Cl. 260—891 **6 Claims**

1. An impact-resistant resinous composition consisting essentially of

a. 70 to 90 percent by weight of a vinyl halide resin selected from the group consisting of polyvinyl halides and copolymers that contain at least 70 percent of vinyl halide units and up to 30 percent of copolymer units;

b. 5 to 15 percent by weight of an elastomer that is a terpolymer that contains 10 to 40 percent of styrene units, 15 to 30 percent of alkyl methacrylate units, and 40 to 65 percent of butadiene units; and

c. 5 to 15 percent by weight of a thermoplastic resin selected from the group consisting of

i. styrene-acrylonitrile copolymers that contain from 50 to 90 percent of styrene, methylstyrene, ethylstyrene, monochlorostyrene, or methoxystyrene units and 10 to 50 percent of acrylonitrile, methacrylonitrile, ethacrylonitrile, or chloroacrylonitrile units; and

ii. styrene-acrylonitrile-alkyl methacrylate terpolymers that contain from 50 to 90 percent of styrene, methylstyrene, ethylstyrene, monochlorostyrene, or methoxystyrene units; 10 to 50 percent of acrylonitrile, methacrylonitrile, ethacrylonitrile, or chloroacrylonitrile units; and 5 to 30 percent of lower alkyl methacrylate units.

3,969,470

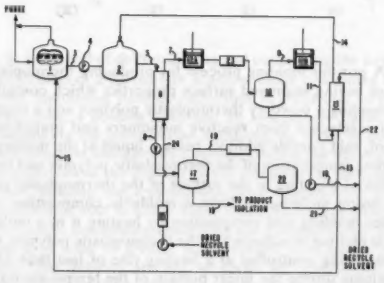
PROCESS FOR RECYCLING HYDROGEN WHEN MAKING BLENDS OF OLEFIN COPOLYMERS

Phillip Poliner Spiegelman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1975, Ser. No. 570,260

Int. Cl.² C08L *23/08, 23/14, 23/16*

U.S. Cl. 260—897 A **13 Claims**



1. In a continuous process for making blends of high and low molecular weight copolymers and recycling the chain-transfer agent gaseous hydrogen for reuse in the process, said process comprising polymerizing ethylene and at least one higher olefin monomer in a solvent for the monomers in separate polymerization reactors in the presence of a coordination catalyst, at least one, but not all, of said reactors containing the chain-transfer agent hydrogen in an amount sufficient to produce low molecular weight copolymer, mixing the resulting solution of high and low molecular weight copolymers, flashing unreacted monomers and hydrogen from the mixture and isolating the blend of high and low molecular weight copolymers and solvent from the unflashed residue, the improvement which comprises circulating the flashed gaseous unreacted monomers and hydrogen together through a staged absorption column and simultaneously passing said solvent through said column to absorb monomer gas in the solvent and thus separate unabsorbable hydrogen gas from monomers and recycling hydrogen in the system to a polymerization reactor for making low molecular weight copolymer.

3,969,471

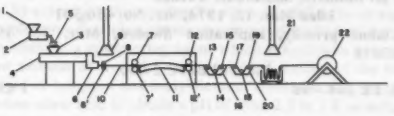
PROCESS OF MANUFACTURING CHROMIC ACID TREATED FOAM FIBRILLATED WEBS

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Jan. 2, 1973, Ser. No. 320,352

Int. Cl.² B29D *7/24, 27/00, 7/20*

U.S. Cl. 264—50 **1 Claim**



1. A process of producing a foam-fibrillated fibrous web comprising extruding a blend of a molten polyolefin resin selected from the group consisting of polyethylene, polypropylene, copolymers of ethylene and propylene or blends thereof, and a gaseous blowing agent from a die into a zone of reduced pressure to produce an extrudate, withdrawing said extrudate from said die by a first take-up means at a linear rate from 2 to 25 times the linear rate at which said blend of molten polyolefin resin and gaseous blowing agent reaches the die lips to form a foam fibrillated web, stretching said foam fibrillated web from two to 10 times in the machine direction, and surface treating the stretched foam fibrillated web in from 90 to 100% sulfuric acid containing from 1 to 20 wt. % chromic acid at from 25° to 100°C. for from 0.1 second to 3 minutes whereby the fibrous web has improved adhesion ability with itself.

3,969,472

METHOD OF MANUFACTURING A FOAM FIBRILLATED FIBROUS WEB FROM AN ISOTACTIC POLYPROPYLENE, POLYSTYRENE AND α-METHYLSTRENE BLEND

Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

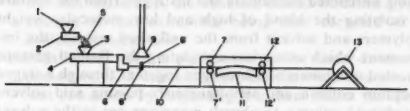
Continuation-in-part of Ser. No. 320,356, Jan. 2, 1973, abandoned. This application Nov. 15, 1973, Ser. No. 416,152

Int. Cl.² B29D *7/24, 27/00*

U.S. Cl. 264—50 **2 Claims**

1. A process of producing a foam fibrillated fibrous web comprising heating a blend of from 50 to 98 weight percent as based on said blend of isotactic polypropylene and from 50 to 2 weight percent as based on said blend of polystyrene which may contain up to 10 weight percent α-methylstyrene, in an extruder to a temperature generally maintained in a range of from 175° to 260°C whereby a molten blend is formed, extruding said blend and from 0.1 to 20 percent by weight as based on said blend of a material which is gaseous under the extru-

sion conditions used mixed with said molten blend from a die which is generally maintained in the temperature range of from 220° to 260°C into a zone of reduced pressure to produce a foam fibrillated fibrous web extrudate, quenching said extrudate to a temperature below about 150°C while withdrawing said extrudate from said die by a first linear take-up



means at a linear rate of from two to 25 times the linear rate at which said blend reaches the lips of said die whereby a foam-fibrillated web is formed, and stretching said foam fibrillated web from two to 10 times in the machine direction at a temperature of from about 90°C to about 150°C to increase the strength thereof.

3,969,473

METHOD OF CORRUGATING A WEB OF THIN THERMOPLASTIC MATERIAL IN A CONTINUOUS PRODUCTION

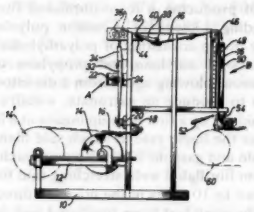
George W. Meek, Fort Myers, Fla., assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Mar. 12, 1974, Ser. No. 450,531

Claims priority, application Sweden, Mar. 13, 1973, 7303518

Int. Cl.² B29C *24/00*

U.S. Cl. 264—90 **1 Claim**



1. Method of continuously forming a corrugated web from thermoplastic thin sheet material which is rendered relatively weak when heated, the corrugations extending at an oblique angle to the side edges of the web, said method comprising;

a. moving the web through a heating zone to soften the thermoplastic material into moldable condition;

b. folding over at least one of the lateral edge portions to produce a thickened edge to reinforce the softened web;

c. introducing the softened web in depending slack condition to a continuously moving longitudinal corrugating zone comprising a series of diagonal ridges and grooves for engaging and advancing the web in said zone;

d. forming the corrugations initially by mechanically depressing the softened advancing web without any substantial stretching thereof progressively into successive grooves while maintaining the introductory portion of the web in slack condition;

e. applying suction beneath the thus initially formed corrugations to draw them against the surfaces of the grooves and to harden and set the thus completed corrugations; and

f. forming a plurality of ribs in said corrugations by drawing the web against corresponding ridges in the corrugating zone in the suction applying step.

3,969,474

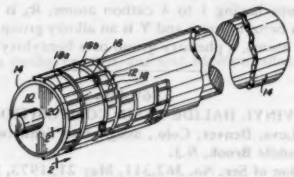
MOLDED STEEL RULE DIE FOR ROTARY DIE CUTTING

John R. Gaug, 9229 Ivanhoe St., Schiller Park, Ill. 60176

Continuation-in-part of Ser. No. 813,831, April 7, 1969, abandoned. This application Sept. 10, 1971, Ser. No. 179,404

Int. Cl.² B29C *1/02, 5/00;* B29D *3/00*

U.S. Cl. 264—219 **7 Claims**



1. A method of making a die adapted for use in cutting blanks from sheet material comprising: positioning steel rules in a mold, said mold having a smooth, hard, unbroken and accurately formed surface, each of a plurality of said rules having a cutting edge abutting said surface, positioning at least one machined metal spacing member between said rules next to said surface and clamping said rules and spacing member in face to face position in said mold by pressure exerted laterally against said rules and spacing member, said spacing member being of less thickness than the height of said rules, casting and solidifying a resin composition against the portions of said rules extending above said spacing member, thereby forming a base having said rules attached thereto, and then separating said base and rules from said spacing member and said mold.

3,969,475

POWDER MOLDING PROCESS FOR PRODUCING THERMOPLASTIC ARTICLES

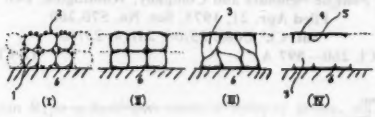
Yasuo Horiuchi, Yokohama, and Toraichi Katsube, Kawasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 501,675, Aug. 29, 1974, abandoned. This application Dec. 20, 1974, Ser. No. 534,894

Claims priority, application Japan, Aug. 31, 1973, 48-97904; Dec. 26, 1973, 49-143942; Dec. 26, 1973, 49-143943; Dec. 26, 1973, 49-143944; Dec. 26, 1973, 49-143945; Dec. 26, 1973, 49-143946; May 15, 1974, 49-53211

Int. Cl.² B29C *5/04*

U.S. Cl. 264—310 **10 Claims**



1. A powder molding process for producing thermoplastic articles having improved surface properties which comprises dry blending a powdery thermoplastic polymer and a curable additive selected from reactive monomers and prepolymers thereof, said curable additive being a liquid at the melting or softening temperature of the thermoplastic polymer and being capable of bleeding to the surface of the thermoplastic polymer during molding, to form a moldable composition, and powder molding said composition by heating it in a mold to initiate melting or softening of the thermoplastic polymer, said heating being controlled at a heating rate of less than 25°C. per minute during the linear portion of the temperature-time curve after the initiation of melting or softening of the thermoplastic polymer, whereby said curable additive bleeds to the surface of the thermoplastic polymer during molding and

cures at said surface so as to improve the surface characteristics thereof.

3,969,476

SOLVENT-IN-PULP EXTRACTION

Bernard H. Lucas, and Gordon M. Ritcey, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 19, 1974, Ser. No. 443,902

Claims priority, application United Kingdom, Feb. 23, 1973, 8978/73

Int. Cl.² C01G *43/00*

U.S. Cl. 423—1 **5 Claims**

1. In a process for the solvent extraction of an aqueous leach slurry containing dissolved metal values, and gangue particles selected from the group consisting of the silica, sericite and sulphide types, with organic amine extractants, at least part of said metal values being extractable by said amine extractants, the improvement comprising pretreating the leach slurry with a fish glue material which is adsorbed onto the gangue solids, the pretreated gangue solids having decreased affinity for the amine extractant during the extraction.

3,969,477

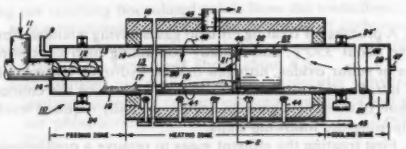
METHOD OF DEFLUORINATING URANIUM COMPOSITIONS IN A CALCINER

W. Gill Keith, San Jose, and F. Donald Ferris, San Martin, both of Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 299,356, Oct. 20, 1972, Pat. No. 3,871,829. This application Mar. 4, 1974, Ser. No. 448,005

Int. Cl.² C01G *43/02*

U.S. Cl. 423—19 **9 Claims**



9. In a method of defluorinating and controlling the oxygen-to-metal ratio of a particulate uranium oxide containing composition containing fluoride impurities in a calciner having a heating zone, a cooling zone and an atmosphere capable of defluorinating the composition including the steps of passing the composition through the calciner, passing the atmosphere countercurrent to the passage of the composition through the calciner, heating the composition at a temperature in the range of about 400° to about 800°C under the atmosphere, the improvement comprising restricting the passage of the atmosphere to a zone of greater flow velocity with said zone of greater flow velocity starting at about the junction of the heating zone and the cooling zone of the calciner and extending into the cooling zone so that the diffusion of gaseous impurities from the heating zone to the cooling zone of the calciner is substantially eliminated.

3,969,478

PROCESS FOR SEPARATION OF TUNGSTEN AND MOLYBDENUM BY EXTRACTION

Abram Naumovich Zelikman, ulitsa D. Ulyanova, 4, korpus 2, kv. 251; Grigory Markovich Voldman, Petrozavodskaya ulitsa, 15, korpus 2, kv. 187, both of Moscow; Viktor Konstantinovich Rumyantsev, ulitsa Sportivnaya, 46, kv. 43, Chirchik Tashkentskoi oblasti; Georgy Nikolaevich Ziberov, sovkhoz Lenina otdelenie 3, ulitsa Lermontova, 9, Krasnodarsky krai, Anapa, and Valery Sergeevich Kagermanian, ulitsa Krasnogo Mayaka, 8, korpus 2, kv. 469, Moscow, all of U.S.S.R.

Filed Jan. 30, 1975, Ser. No. 545,708

Int. Cl.² B01D *11/00*; B01J *1/04*; C01G *37/00*, *39/00*

U.S. Cl. 423—54 **10 Claims**

1. A process for the separation of tungsten and molybdenum by extraction comprising the steps of: adding to an aqueous solution containing chemical compounds of tungsten and molybdenum a complexing agent which is hydrogen peroxide in an amount of from 1.5 to 2 mol per l g-atom of the total content of tungsten and molybdenum; adding to the resulting solution an acid selected from the group consisting of nitric, hydrochloric and sulfuric acids to obtain a pH of the solution from 0.5 to 1.8; and selectively extracting molybdenum from the resulting solution with an organic extracting agent selected from the group consisting of tri-n-butyl phosphate, tributyl phosphine oxide and trioctylamine with the volumetric ratio of the aqueous organic solutions of from 1:1 to 1.5.

9. A process for the separation of tungsten and molybdenum by extraction comprising the steps of: adding to an aqueous solution containing chemical compounds of tungsten and molybdenum a complexing agent which is hydrogen peroxide in an amount of from 1.5 to 2 mol per l g-atom of the total content of tungsten and molybdenum; adding to the resulting solution nitric acid to obtain a pH of from 2.5 to 2.8 or sulfuric acid to obtain a pH of 4.3; and selectively extracting molybdenum from the resulting solution with a salt of a quaternary ammonium base with the volumetric ratio of the aqueous to organic solutions of from 1:1 to 1.5.

3,969,479

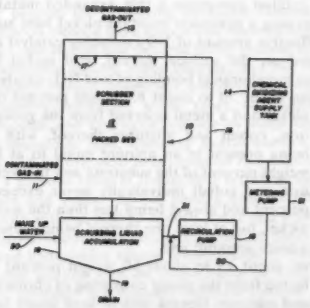
ODOR CONTROL METHOD

Perry B. Lonnes; Carl M. Peterson, both of St. Paul, Minn.; Dale A. Lundgren, Gainesville, Fla., and Laverne W. Rees, St. Paul, Minn., assignors to Environmental Research Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 167,925, Aug. 2, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,240

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **8 Claims**



1. In a method for oxidizing constituents of a gaseous fluid with minimum consumption of chemical oxidizing agent which comprises:

passing the odorous gaseous fluid through a bed of packing material contained in a scrubber;

simultaneously passing an aqueous solution of a predetermined concentration of chemical oxidizing agent selected from the group consisting of $NaClO_2$, Cl_2, $KMnO_4$, $NaMnO_4$, O_3, and H_2O_2 through the packing material to thereby cause contact between the gaseous fluid and the aqueous solution, oxidation of the odorous constituents and precipitation of solid chemical reaction products; and

discharging the treated gaseous fluid from the scrubber;

the improvement comprising:

passing the aqueous solution containing the solid precipitates into a holding tank disposed at an elevation lower than the scrubber;

accumulating by gravity the solid precipitates at the bottom of the holding tank;

purging a quantity of the accumulated solid precipitates, the quantity comprising 1–5% by weight of the total amount of circulating aqueous solution, from the bottom of the holding tank;

introducing water to the holding tank above the level of the accumulated solid precipitates therein;

pumping the aqueous solution, with the added water, from the holding tank from a point above the level of the accumulated solid precipitates through a line terminating in the scrubber above the bed of packing material;

adding fresh oxidizing agent to the line at a point intermediate the holding tank and scrubber in a controlled amount, wherein the amount of fresh oxidizing agent added to the line and the amount of water added to the holding tank maintain the predetermined concentration of the aqueous solution.

3,969,480

NICKEL BASE NO_x REDUCING CATALYTIC STRUCTURE

Robert J. Fedor, Westlake, and Cameron S. Ogden, Hudson, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 207,284, Dec. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 149,331, June 2, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,032

Int. Cl.² C01B *33/00*

U.S. Cl. 423—213.5 **19 Claims**

1. In the combination comprising an internal combustion engine and a catalyst for catalytically reducing nitrogen oxides in the exhaust gases of said engine, the improvement wherein said catalyst comprises a thin expanded metal foil structure comprising a corrosion resistant nickel base substrate having an effective amount of NO_x reducing catalyst metallurgically bonded on the surface thereof, said nickel base substrate before metallurgical bonding of said NO_x catalyst comprising:

from about 50 to about 85 weight percent of a mixture of nickel and a metal selected from the group consisting of iron, cobalt and mixtures thereof, with nickel always being present in an amount equal to at least about 17 weight percent of the substrate and the weight percent of iron and cobalt individually never exceeding about 40 percent and always being less then the weight percent of nickel, but at least one thereof being present in excess of a trace amount; and

from about 15 to about 50 weight percent of a metal selected from the group consisting of chromium, aluminum and mixtures thereof with at least about 5weight percent of chromium always present in the substrate and the amount of aluminum never exceeding about 10 weight percent;

the chemical composition of the catalytic layer being different than the chemical composition of said substrate.

3,969,481

PROCESS FOR GENERATING ULTRA HIGH PURITY H_2 OR O_2

John N. Murray, Lutherville, Md., and Robert J. Hynek, Brookfield, Wis., assignors to Isotopes, Inc., Westwood, N.J.

Filed Nov. 3, 1972, Ser. No. 303,392

Int. Cl.² C01B *13/00*

U.S. Cl. 423—219 **20 Claims**

1. A process for purifying hydrogen gas containing a small amount of oxygen and a catalyst poison comprising placing a plurality of alternating contiguous layers of an adsorbent for said catalyst poison and a catalyst for catalysing the formation of water from hydrogen and oxygen in a single container, passing said hydrogen gas through said container, said layers being arranged in said container so that the first layer which the gas meets in the container and the last layer the gas meets in the container are adsorbent layers, and withdrawing a purified hydrogen gas from said container.

3,969,482

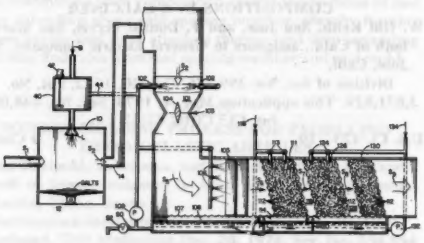
ABATEMENT OF HIGH CONCENTRATIONS OF ACID GAS EMISSIONS

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Filed Apr. 25, 1974, Ser. No. 463,651

Int. Cl.² B01D *53/34*

U.S. Cl. 423—235 **16 Claims**



1. A process for treating effluent gases having a temperature above about 350°F. and initially containing high concentrations of sulfur oxides, nitrogen oxides, hydrogen halides, silicon tetrafluoride and mixtures thereof to reduce the concentrations of these acid gases to environmentally required levels, comprising the following steps:

1. First treating the effluent gases to remove a predominant portion of the acid gases by the steps of:

a. spraying into said effluent gases an aqueous solution or slurry of a basic material selected from the group consisting of: the oxides, hydroxides, carbonates and bicarbonates of the alkali metals, alkaline earth metals, zinc, nickel, copper and iron; nepheline syenite and phonolite; and mixtures thereof;

b. adjusting the concentration of basic material in said solution or slurry and the rate of addition of solution or slurry such that 60–95% of the acid gases initially present react with said basic material for form a solid salt reaction product and the hot effluent gases rapidly evaporate substantially all of the liquid water thereby cooling the effluent gases to a temperature below about 250°F. and humidifying the gases to a relative humidity of about 20–50%; and,

c. separating the larger solid salt particles from the effluent gases by gravity; and,

2. Thereafter further treating the effluent gases for the removal of residual acid gases and solid particles by the steps of:

a. contacting the effluent gases with a particulate sorbent material selected from nepheline syenite, phonolite and

mixtures thereof to sorb residual acid gases to environmentally acceptable levels; and,

b. separating the mixture of effluent gases and particulate material by filter means.

3,969,483

REMOVAL OF CARBONACEOUS MATTER FROM AMMONIUM POLYPHOSPHATE LIQUIDS

John M. Stinson, Sheffield; Horace C. Mann, Jr., Florence, both of Ala., and Dale H. Johnson, Downers Grove, Ill., assignors to Tennessee Valley Authority, Muscle Shoals, Ala. and Akzona Incorporated, Ashville, N.C.

Continuation of Ser. No. 521,752, Nov. 7, 1974, Pat. No. T942,007. This application June 5, 1975, Ser. No. 583,873

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—305 10 Claims

1. An improved process for the removal of carbonaceous matter from ammoniated polyphosphate solutions wherein:

said solutions have a pH above about 4.5;

said solutions are prepared by the molecular dehydration and subsequent or concurrent ammoniation of wet-process phosphoric acid containing about 50 to 72 percent P_2O_5;

said carbonaceous matter results from organic impurities in said wet-process phosphoric acid;

said carbonaceous matter chars during the molecular dehydration of said wet-process orthophosphoric acid to superphosphoric acid, the improvement therein for removing substantially all of the black particualte carbonaceous matter therein by flocculation and subsequent flotation thereby eliminating any requirement for filtering means therein;

which improved process comprises the steps of adding to the solution from about 0.015 to about 0.075 percent by weight of a water-insoluble primary amine having a lower density than the ammoniated polyphosphate solution and immiscible therewith; adding to the solution from about 0.005 to about 0.075 percent by weight of a water-insoluble quaternary ammonium chloride having a lower density than the ammoniated polyphosphate solution and immiscible therewith; agitating the resulting mixture to bring said amine and said quaternary into intimate contact with said solution; holding the solution until the solids flocculate and float to the surface; and separating the resulting flocculated solids from the underflow.

6. An improved process for the removal of carbonaceous matter from ammoniated polyphosphate solutions wherein;

said solutions have a pH above about 4.5;

said solutions are prepared by the molecular dehydration and subsequent or concurrent ammoniation of wet-process phosphoric acid containing about 50 to 72 percent P_2O_5;

said carbonaceous matter results from organic impurities in said wetprocess phosphoric acid;

said carbonaceous matter chars during the molecular dehydration of said wet-process orthophosphoric acid to superphosphoric acid, the improvement therein for removing substantially all of the black particulate carbonaceous matter therein by flocculation and subsequent flotation thereby eliminating any requirement for filtering means therein;

which improved process comprises the steps of adding to the solution from about 0.015 to about 0.075 percent by weight of a water-insoluble acetic acid salt of a primary amine having a lower density that the ammoniated polyphosphate solution and immiscible therewith; adding to the solution from about 0.005 to about 0.075 percent by weight of a water-insoluble quaternary ammonium chloride having a lower density than the ammoniated polyphosphate solution and immiscible therewith; agitating the resulting mixture to bring said amine and said quaternary into intimate contact with said solution; holding the solution until the solids flocculate and float to the surface; and separating the resulting flocculated solids from the underflow.

3,969,484

PROCESS FOR RECOVERING TUNGSTEN FROM ALKALINE LEACHING SOLUTION OF TUNGSTEN ORES

Satoshi Onozaki, Mitaka; Shogo Nemoto, Iwaki, and Takeshi Hazeyama, Mitaka, all of Japan, assignors to Nittetsu Mining Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,240

Claims priority, application Japan, Mar. 22, 1974, 49-31446

Int. Cl.² C01G *39/00, 41/00*

U.S. Cl. 423—58 5 Claims

1. A process for recovering tungsten values from an alkaline solution employed in the leaching of tungsten ores containing molybdenum, which comprises:

adjusting the pH of said alkaline leaching solution containing tungsten and molybdenum values to a range of 7–8 with a mineral acid which does not form a precipitate with calcium ions, whereby the molybdenum values and tungsten values exist as molybdic acid and tungstic acid, respectively;

oxidizing said molydbic acid ions in solution; adding at least twice the stoichiometric amount with respect to said molybdic acid of at least one sulfide ion donor selected from the group consisting of hydrogen sulfide, alkali sulfides and alkali hydrosulfide to said molydbic acid containing solution at a temperature of 30°–80°C whereby molybdic acid ions are converted to complex thiomolybdate ions;

adjusting the pH of said sulfide ion treated solution to 2–3 with a mineral acid which does not form a precipitate with calcium ions;

separating the molybdenum sulfide compounds upon cooling which precipitate from pH adjusted solution;

oxidizing said tungstic acid in the molybdenum free solution;

adding at least one calcium ion donor selected from the group consisting of calcium chloride and calcium hydroxide to said tungstic acid containing solution at 30°–80°C which converts tungstic acid ions to calcium tungstate; and

cooling said calcium tungstate containing solution to precipitate said calcium tungstate from solution which thereafter is separated from the solution.

3,969,485

PROCESS FOR CONVERTING SILICON-AND-FLUORINE-CONTAINING WASTE GASES INTO SILICON DIOXIDE AND HYDROGEN FLUORIDE

Gosta Lennart Flemmert, Hamngatan 22, Nynashamn, Sweden

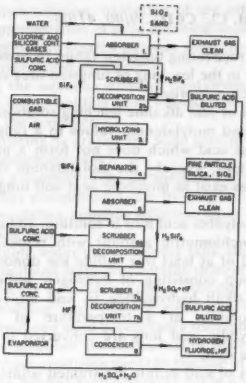
Continuation-in-part of Ser. No. 193,467, Oct. 28, 1971, abandoned. This application Dec. 4, 1974, Ser. No. 529,315

Int. Cl.² C01B *33/18*

U.S. Cl. 423—337 29 Claims

1. A cyclic process for producing hydrogen fluoride and highly active silicon dioxide from silicon-and fluorine-containing waste gases, the silicon and fluorine being present at least as silicon tetrafluoride and hydrogen fluoride, and also silicon dioxide, if present, which comprises combining water and silicon-and fluorine-containing waste gases and absorbing silicon tetrafluoride and hydrogen fluoride in water thereby forming hydrofluosilicic acid; blending hydrofluosilicic acid with concentrated sulfuric acid to decompose hydrofluosilicic acid to form a gaseous effluent comprising tetrafluoride, hydrogen fluoride and water vapour; passing gaseous effluent into contact with sulfuric acid to absorb water and hydrogen fluoride therefrom: recovering silicon tetrafluoride from gaseous effluent and hydrolyzing silicon tetrafluoride by blending with combustible gas and with air, and burning to form silica and hydrogen fluoride; withdrawing residual sulfuric acid; separating silica formed in the hydrolysis; blending effluent gases from the combustion containing hydrogen fluoride, water vapour, unreacted silicon tetrafluoride and combustion products with a member selected from the group consisting of

water and aqueous hydrofluoric acid solution to form aqueous hydrofluosilicic acid solution and venting unabsorbed exhaust gases, now relatively free from fluorine-containing materials, to the atmosphere; combining and decomposing hydrofluosilicic acid with concentrated sulfuric acid; liberating and volatilizing hydrogen fluoride and water vapour; removing water vapour; recovering hydrogen fluoride and recovering sulfuric acid.



3,969,486

PROCESS FOR SYNTHESIS OF CHLORODIFLYROAMINE

Joseph Gordon, Morris Township, Morris County, and Bernard Sukornick, Elizabeth, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 15, 1962, Ser. No. 218,479
Int. Cl.[2] C01B 21/52, 7/00
U.S. Cl. 423—351 6 Claims

1. The process for making chlorodifluoroamine which comprises introducing gaseous fluorine azide and at least a stoichrometric equivalent of gaseous chlorine into a reaction zone, maintaining temperature in the reaction zone substantially in the range of 20°–100° C., and discharging chlorodifluoroamine from the reaction zone.

3,969,487

PROCESS FOR SYNTHESIS OF CHLORODIFLUOROAMINE

Thomas E. Austin, Winston-Salem, N.C., and Robert W. Mason, Morris Plains, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 26, 1963, Ser. No. 279,696
Int. Cl.[2] C01B 21/52, 7/00
U.S. Cl. 423—351 10 Claims

1. The process for making chlorodifluoroamine which comprises continuously introducing into a reaction zone — containing a comminuted alkali metal azide-alkali metal chloride mixture having an azide-chloride weight ratio of one to not less than 3 — an inert gas-elemental fluorine gas mixture having an inert gas-fluorine volume ratio of one to not more than 5, maintaining in the reaction zone reactive temperature not substantially above 50° C., and discharging from the reaction zone gaseous reaction products containing chlorodifluoroamine.

3,969,488

PROCESS FOR THE MANUFACTURE OF SODIUM CARBONATE

Alan C. Shaw, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold, Canada

Filed Aug. 25, 1975, Ser. No. 607,229
Int. Cl.[2] C01D 7/00; C01F 7/34
U.S. Cl. 423—421 14 Claims

1. A process for the production of sodium carbonate, which comprises contacting subdivided solid sodium aluminate with a gas stream comprising water vapor and carbon dioxide at a temperature above the dew point of said atmosphere and below about 200°C to cause reaction between said sodium aluminate, carbon dioxide and water vapor in accordance with the equation:

$$2NaAlO_2 + 3H_2O + CO_2 \rightarrow Na_2CO_3 + 2Al(OH)_3$$

and recovering a solid mass containing sodium carbonate.

3,969,489

PROCESS FOR RECOVERING SYNTHETIC DIAMONDS FROM PRESSED RUNS

Mu-Sheng Wu, Worthington, Ohio, assignor to General Electric Company, Columbus, Ohio

Filed Sept. 24, 1975, Ser. No. 616,299
Int. Cl.[2] C01B 31/06
U.S. Cl. 423—446 16 Claims

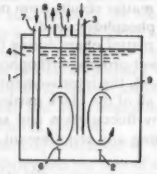
1. A process for the recovery of synthetic diamond from a diamond synthesis run containing diamond crystals, a non-diamond carbonaceous material and a metallic catalyst which comprises: pretreating the run with liquid bromine to dissolve the non-diamond carbonaceous material; separating the bromine-carbon mixture from the remaining run material; chemically treating the remaining run material to remove the catalyst; and recovering the remaining diamond crystals.

3,969,490

PRODUCTION OF HYDROGEN CHLORIDE BY THERMAL DISSOCIATION OF ORGANIC SUBSTANCES CONTAINING CHLORINE

Gerard de Beuckelaer, Hoevenen, Belgium; Gerd Krome, Ludwigshafen, Germany; Jan Langens, Kapellen, Belgium; Ferdinand Lockefeer, Berchem, Belgium, and Paul Schaerlaekens, Ekren, Belgium, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 12, 1973, Ser. No. 423,924
Claims priority, application Germany, Dec. 16, 1972, 2261795
Int. Cl.[2] C01B 7/08, 7/01
U.S. Cl. 423—481 4 Claims



1. A process for the production of hydrogen chloride by thermal dissociation of an organic substance containing chlorine, wherein in a first stage, in which a temperature of from 400° to 1200°C. prevails, the substance containing chlorine is introduced into a salt melt of one or more alkali metal chlorides in the absence of oxygen, hydrogen chloride is discharged from reaction mixture and in a second stage, in which a temperature of from 650° to 1250°C. prevails, oxygen is supplied to the melt for the combustion of organic constituents remaining in it, and the combustion products are removed.

3,969,491

PURIFICATION OF ALKALI METAL CHLORIDES AND BROMIDES

Ricardo C. Pastor, Manhattan Beach, and Arthur J. Timper, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 351,214, April 16, 1973. This application Aug. 18, 1975, Ser. No. 605,697

Int. Cl.² C01D *3/14, 3/20, 3/04, 3/10*

U.S. Cl. 423—499 5 Claims

1. A method for the purification of alkali metal chlorides and bromides containing trace cationic and anionic impurities comprising the steps of exposing the reaction apparatus to a mascent sweep halogen gas for 10 hours to remove contaminants, forming a moving molten zone in said alkali metal halide placed in said apparatus while scrubbing said metal halide with a continuous stream of a gaseous nascent halogen corresponding to the halide of the alkali metal being scrubbed for 5 hours and allowing said halide to cool under a continuous stream of gaseous nascent halogen, thereby obtaining said alkali metal halides having a purity useful in laser technologies.

3,969,492

RECOVERY OF ELEMENTAL SULFUR FROM SULFUR DIOXIDE BEARING WASTE GASES

Michael Witte, Chatham, and Manankumar S. Mehta, Parsippany, both of N.J., assignors to U.S. Filter Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,540

Int. Cl.² C01D *17/04*

U.S. Cl. 423—574 L 1 Claim

1. In the removal of sulfur dioxide values from a sulfur dioxide bearing industrial gas stream,

the steps of

introducing a sulfur dioxide bearing gas stream, into absorbent contact with an aqueous solution of mixed mono-ammonium phosphate and di-ammonium phosphate in which the weight proportion of mono- to di-ammonium phosphate is in the range of about 4 to 1 to about 10 to 1 to effect removal of sulfur dioxide values from said gas stream in said solution,

and reacting said absorbed sulfur dioxide values in said solution with hydrogen sulfide to reduce the sulfur therein to elemental sulfur.

3,969,493

THERMOCHEMICAL PROCESS FOR MANUFACTURE OF HYDROGEN AND OXYGEN FROM WATER

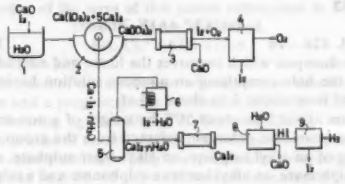
Kinjiro Fujii, Komae, and Wakichi Kondo, Kanagawa, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,873

Claims priority, application Japan, June 21, 1974, 49-70917

Int. Cl.² C01B *13/00*

U.S. Cl. 423—579 6 Claims



1. A process for the manufacture of hydrogen and oxygen from water, which process comprises the steps of allowing iodine and calcium hydroxide to react with each other in the presence of water at 20° to 100°C, separating calcium iodate and calcium iodide from the resultant reaction product, heating calcium iodate until it is converted into calcium oxide for thereby generating a mixed gas of iodine and oxygen, cooling the generated mixed gas thereby allowing the iodine component thereof to be educed in the form of crystals and simultaneously effecting liberation of oxygen gas therefrom, causing calcium iodide to react with steam at 400° to 750°C to give rise to hydrogen iodide and decomposing the generated hydrogen iodide into hydrogen and iodine.

3,969,494

METHOD FOR IMPROVEMENT OF PROPERTIES OF SYNTHETIC YELLOW IRON OXIDE

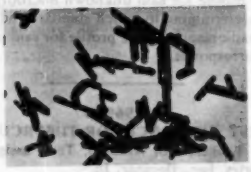
Soichiro Nobuoka, Nara; Takashi Asai, Minoo, and Kazuaki Ado, Sakai, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 21, 1975, Ser. No. 551,652

Claims priority, application Japan, Feb. 22, 1974, 49-21846

Int. Cl.² C01G *49/02*

U.S. Cl. 423—633 5 Claims



1. A method for the improvement of properties of synthetic yellow iron oxide, which comprises dispersing said synthetic yellow iron oxide in an aqueous 0 – 10N alkali solution, subjecting the resultant slurry to a hydrothermal treatment at temperatures in the range of 100° – 250°C under saturated pressure of steam and recovering from the hydrothermally treated slurry the yellow iron oxide.

3,969,495

THERMOCHEMICAL PRODUCTION OF HYDROGEN

Robert M. Dreyfuss, Mount Vernon, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,749

Int. Cl.² C01B *1/03*

U.S. Cl. 423—648 7 Claims

1. A thermochemical process cycle for the production of hydrogen from water comprising the steps of:

a. reacting a metal oxide with a metalloid from one of groups V and VI of the periodic system and with sulfur dioxide, thereby producing the corresponding metal sulfate and an intermetallic compound of the corresponding metal and the metalloid,

b. hydrolyzing the intermetallic compound with sulfuric acid, thereby producing the corresponding metal sulfate and a compound of hydrogen and the metalloid,

c. thermally decomposing the compound of hydrogen and the metalloid, thereby producing hydrogen and regenerating the metalloid.

d. thermally decomposing the product metal sulfate, thereby producing oxygen and sulfur trioxide and regenerating the metal oxide and sulfur dioxide,

e. reacting the product sulfur trioxide with water, thereby regenerating sulfuric acid,

f. recycling the regenerated metalloid, regenerated metal oxide and regenerated sulfur dioxide to step (a), and

g. recycling the regenerated sulfuric acid to step (b).

3,969,496

USE OF RADIOISOTOPES FOR RAPID IDENTIFICATION OF MICROORGANISMS

Joseph R. Schrot, Silver Spring, Md., assignor to Biospherics Incorporated, Rockville, Md.

Filed Dec. 28, 1973, Ser. No. 429,629

Int. Cl.[2] G01N *33/00*; G01T *1/16*; G21H *5/02*; C12K *1/06*

U.S. Cl. 424—1 12 Claims

1. A process for the rapid identification of a microorganism which comprises inoculating a number of different ^{14}C labeled substrates with an unknown microorganism, at least some of said ^{14}C labeled substrates being capable of being metabolized to $^{14}CO_2$ by certain specific microorganisms, incubating said substrates for a time sufficient to cause metabolic breakdown of at least some of said substrates resulting in the production of $^{14}CO_2$, analyzing for radioactivity in the CO_2 which is evolved from those substrates which are metabolized to determine which substrates are metabolized and to what extent by said unknown microorganisms, thereby obtaining a substrate radiorespirometric profile for said unknown microorganism, comparing said substrate radiorespirometric profile to standard radiorespirometric profiles for known microorganisms obtained by the same process by which the substrate radiorespirometric profile for said unknown microorganism was obtained and determining to which standard radiorespirometric profile the radiorespirometric profile for said unknown microorganism corresponds.

3,969,497

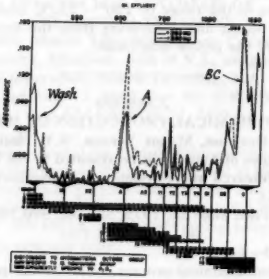
TEST SUBSTANCE FOR TUBERCULOSIS

William T. Kniker, San Antonio, Tex., assignor to Lincoln Laboratories, Inc., Decatur, Ill.

Filed May 5, 1971, Ser. No. 140,444

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—12 8 Claims



1. In a method for preparing a test substance having both high specificity and high sensitivity for detecting immunological sensitization to *M. tb.* in humans and animals which includes the steps of:

a. providing at least one *M. tb.* culture filtrate; and

b. fractionating said filtrate by means of ion-exchange chromatography so as to produce a plurality of chromatographic fractions;

the improvement which comprises:

c. subfractionating a plurality of said chromatographic fractions so as to produce a plurality of subfractins, each of which contains at least one *M. tb.* specific antigen and is substantially free of cross-reactive antigens; and

d. mixing a plurality of said *M. tb.* specific subfractions so as to produce a test substance which is substantially free of cross-reactive antigens and contains a plurality of *M. tb.* specific antigens.

3,969,498

DRESSING AND METHOD FOR TREATING A WOUND

Patrick N. Catania, and James C. King, both of Stockton, Calif., assignors to University of the Pacific, Stockton, Calif.

Filed Sept. 13, 1973, Ser. No. 397,203

Int. Cl.[2] A61K *9/70*

U.S. Cl. 424—28 6 Claims

1. In a wound dressing of the type having a water soluble solid, self-supporting flexible body consisting essentially of a film-forming polymer in integral non-discrete form in an amount sufficient to form an artificial eschar with the moist elements at the situs of the wound, the improvement in which said film-forming polymer is a plasma and water soluble dextran polymer having an average molecular weight of about 40,000 to about 100,000.

3,969,499

DENTAL ADHESIVE MATERIALS CONTAINING FLUORIDE COMPOUNDS

Henry L. Lee, Jr., San Marino, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 146,466, May 24, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,048

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 14 Claims

1. A composition of matter comprising a polymeric reaction product of a hydroxy terminated butadiene prepolymer having an average molecular weight of about 400 to 25,000 and containing 1 to 3 hydroxyl groups per molecule and a polyisocyanate reactant present in an amount to provide from 1.5 to 2.7 isocyanate groups for each hydroxyl group or active hydrogen site, and from 1 to 70% by weight of a fluoride ion containing compound capable of releasing fluoride ion.

3,969,500

SHAMPOO CONTAINING A WATER-SOLUBLE LINEAR CARBOXYLIC POLYMER

Malcolm George Kennerley, Edwalton, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 336,093, Feb. 26, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,696

Claims priority, application United Kingdom, Mar. 3, 1972, 9969/72

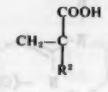
Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—10 1 Claim

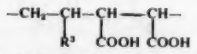
1. A shampoo which improves the lustre and ease of combing of the hair comprising an aqueous solution having a pH value of from about 3 to about 10 of

i. from about 5 to about 50% by weight of a non-soap synthetic anionic detergent selected from the group consisting of an alkyl sulphate, an alkyl ether sulphate, an alkyl sulphonate, an alkyl benzene sulphonate and a sulphosuccinate; and

ii. from 0.05 to 5% by weight of a water soluble carboxylic linear polymer having a molecular weight of about 1,000 to about 500,000 which contains repeating carboxylic acid units selected from the formulae consisting of:



and



wherein R^2 is H or CH_3 and R^3 is H or OCH_3, or the water soluble salt thereof.

3,969,501

ANTIBIOTIC 342-14-I AND PRODUCTION THEREOF

Jun'ichi Shoji, Hirakata; Mikao Mayama, Ikeda; Shinzo Matsuura, Itami; Kouichi Matsumoto, Toyonaka, and Yoshiharu Wakisaka, Takarazuka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 23, 1975, Ser. No. 580,341

Claims priority, application Japan, June 19, 1974, 49-70712

Int. Cl.² A61K *35/74*

U.S. Cl. 424—118 **3 Claims**

1. An antibiotic, 342-14-I, effective in inhibiting the growth of gram-positive microorganism, the said antibiotic being a colorless amphoteric powder which melts and decomposes at 190°–195°C; contains the elements carbon, hydrogen, nitrogen and oxygen in substantially the following proportions by weight:

Carbon	54.63 %
Hydrogen	7.12 %
Nitrogen	14.81 %
Oxygen	23.44 %(balance):

has a hydrochloric acid salt with an optical rotation of $[\alpha]_D^{22.0}$ + 6.1 ± 0.5° (c=1.036 %, in methanol); has a molecular weight of about 1450 (estimated from amino acid analysis); shows the formation of aspartic acid, threonine, glycine, valine, isoleucine, phenylalanine, tryprophane, 2,4-diaminobutyric acid, ammonia and anteisononanoic acid by acid hydrolysis; has a hydrochloric acid salt with ultraviolet absorption (in methanol) at 274, 283 and 290.5 mμ; and has a hydrochloric acid salt with an infrared absorption spectrum as in the attached drawing, FIG. 1.

3,969,502

METHOD FOR CONTRACEPTION BY THE ADMINISTRATION OF SEQUENTIAL CONTRACEPTIVE PREPARATIONS

Ursula Lachnit-Fixson, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berin & Bergkamen, Germany

Continuation-in-part of Ser. No. 350,590, April 12, 1973, Pat. No. 3,939,264. This application July 9, 1974, Ser. No. 486,757

Claims priority, application Germany, Apr. 14, 1972, 2218831; Mar. 3, 1973, 2310963; July 9, 1973, 2335265

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² A61K *31/56*

U.S. Cl. 424—239 **9 Claims**

1. A method of contraception wherein a combination of an estrogen and a progestogen is administered orally to a female of child-bearing age for about 21 days and for the next 5–7 days, for a total of about 28 days, no estrogens and progestogens are administered, which comprises administering orally daily for the first 10–12 days either a combination of:

a. 0.030 mg. of 17α-ethinylestradiol and
0.050 mg. of d-norgestrel,

or a combination of:

b. 0.030 mg. of 17α-ethinylestradiol and
1 mg. of 17α-ethinyl-19-nortestosterone acetate;

and then administering orally daily for the next 11–9 days, when combination (a) is administered for the first 10–12 days, a combination of

c. 0.040 mg. of 17α-ethinylestradiol and
0.125 mg. of d-norgestrel,

or when combination (b) is administered for the first 10–12 days, a combination either of:

d. 0.050 mg. of 17α-ethinylestradiol and
2 mg. of 17-ethinyl-19-nortestosterone acetate; or

e. 0.050 mg. of 17-ethinylestradiol and
2 mg. of cyproterone acetate.

3,969,503

COMPOSITIONS AND METHODS USEFUL IN RENDERING LITHOGENIC MAMMALIAN BILE NON-LITHOGENIC

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.

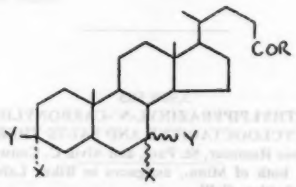
Filed Oct. 2, 1975, Ser. No. 618,900

Int. Cl.² A61K *31/56*

U.S. Cl. 424—240 **6 Claims**

1. A composition for rendering lithogenic mammalian bile non-lithogenic which comprises, in combination:

a. a small but effective amount of a compound of the formula



wherein each Y is hydrogen; each X is hydroxy or acyloxy; when taken together X and Y is oxo (O=); and R is hydroxy, acyloxy or alkoxy; and pharmaceutically acceptable salts thereof; and

b. a small but effective amount of a choloretic agent selected from the group consisting of dehydrocholic acid, glycocholic acid, florantyrone and tocamphyl.

3,969,504

6-PHENYL BENZODIAZEPINE ANTIDEPRESSANTS

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Co., Kalamazoo, Mich.

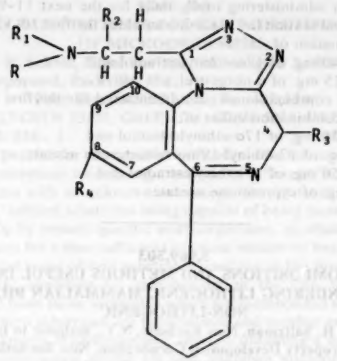
Continuation-in-part of Ser. No. 550,120, Feb. 14, 1975, which is a continuation of Ser. No. 361,348, May 17, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,170

The portion of the term of this patent subsequent to June 17, 1993, has been disclaimed.

Int. Cl.² A61K *31/33*

U.S. Cl. 424—244 **9 Claims**

1. A process for treating depression comprising the administration to a human or animal subject an effective anti-depressant amount of a compound of the formula:



wherein R, R_1, R_2 and R_3 are hydrogen, methyl or ethyl, and R_4 is hydrogen, fluorine, chlorine, bromine, $-NO_2$, $-CF_3$, or methylthio, inclusive; or a pharmacologically acceptable acid addition salt thereof, in association with a pharmaceutical carrier.

3,969,505

8-N-METHYLPIPERAZINYL-N′-CARBONYLDIBENZOBICYCLOOCTADIENE AND SALTS THEREOF

Walton James Hammar, St. Paul, and Alvin C. Conway, North St. Paul, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 339,359, March 8, 1973, Pat. No. 3,904,630. This application July 11, 1975, Ser. No. 595,288

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **1 Claim**

1. The method for effecting sedative action upon the mammalian central nervous system which comprises administering an effective amount of a compound of the group consisting of 8-anti-(N-methylpiperazinyl-N′-carbonyl)dibenzobicyclo[3.2.1]octadiene and a pharmaceutically acceptable salt thereof to a mammalian subject.

3,969,506

PHARMACOLOGICALLY ACTIVE TRICYCLIC QUINAZOLINONES

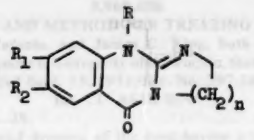
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 324,996, Jan. 19, 1973, Pat. No. 3,887,559, which is a continuation-in-part of Ser. No. 87,016, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 828,757, May 28, 1969, Pat. No. 3,598,823. This application Feb. 26, 1975, Ser. No. 553,143

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **14 Claims**

1. The method of effecting bronchodilation in an animal in need of said treatment comprising administering to said animal a bronchodilating effective amount of a compound of the formula:

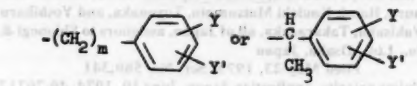


wherein

each of R_1 and R_2 is, independently, hydrogen, halo of atomic weight not greater than 36 or alkyl of 1 to 3 carbon atoms, or are either both hydroxy or both are alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, hydroxy or lower alkoxy of 1 to 2 carbon atoms,

n is 1 to 3,

R is alkyl of 1 to 5 carbon atoms,



m is 1 or 2,

each of Y and Y′ is, independently, hydrogen, halo of atomic weight not greater than 36 or alkyl of 1 to 3 carbon atoms, or either both are hydroxy or both alkoxy of 1 to 2 carbon atoms, or one is hydrogen and the other bromo, hydroxy or alkoxy of 1 to 2 carbon atoms, provided that no more than two of R_1, R_2, Y and Y′ are hydroxy, further provided that neither of R_1 and R_2 is hydroxy when either of Y and Y′ is alkoxy and further provided that neither of Y and Y′ is hydroxy when either of R_1 and R_2 is alkoxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,969,507

METHOD OF PREVENTING AND TREATING THROMBOSIS

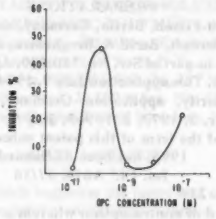
Hideaki Kohri, Tokushima, Japan, assignor to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

Filed Nov. 11, 1974, Ser. No. 522,835

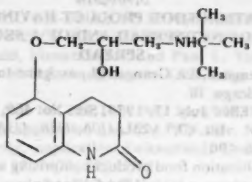
Claims priority, application Japan, Nov. 10, 1973, 48-125930

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **7 Claims**



1. A method for preventing blood platelet aggregation and minimizing blood platelet adhesion comprising applying in vitro to blood or in vivo to mammals afflicted with thrombosis an effective amount of 5-(hydroxy-3-t-butylamino)propoxy-3,4-dihydrocarbostyril having the formula



3,969,508

LOWERING THE CONCENTRATION OF PLASMA TRIGLYCERIDES

Nicholas W. DiTullio, Holmes, Pa.; Charles P. Lowman, Cherry Hill, N.J.; Alfred R. Maass, Swarthmore, and Harry L. Saunders, Willow Grove, both of Pa., assignors to Smith-Kline Corporation, Philadelphia, Pa.

Filed Nov. 27, 1974, Ser. No. 527,560
Int. Cl.² A61K *31/19*, *31/38*
U.S. Cl. 424—275 5 Claims

1. A method of lowering the concentration of plasma triglycerides in a hyperlipidemic subject, which comprises administering internally to said subject a nontoxic amount, sufficient to lower said triglyceride concentration, of the compound 4-(2-thenoyl)-2,3-dichlorophenoxyacetic acid, an alkali metals salt of said acid or a pharmaceutically acceptable addition salt of said acid formed with a base.

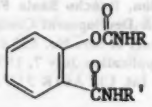
3,969,509

ORTHO-CARBAMYLOXY-BENZAMIDE BACTERICIDES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 466,107, May 2, 1974, Pat. No. 3,888,906.
This application Mar. 21, 1975, Ser. No. 560,841
Int. Cl.² A01N *9/20*
U.S. Cl. 424—300 3 Claims

1. A method of controlling bacteria comprising applying to the habitat thereof a bactericidally effective amount of a compound having the formula



wherein R is halogen substituted phenyl at least one of said halogen substituents being in the meta position and R' is selected from the group consisting of hydrogen and phenyl.

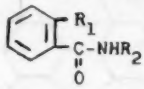
3,969,510

METHOD OF CONTROLLING FUNGI

Hans Osieka, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Hans Kiefer, Wachenheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 234,982, March 15, 1972, abandoned, which is a continuation of Ser. No. 53,307, July 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 722,549, April 19, 1968, abandoned. This application June 9, 1975, Ser. No. 584,859
Claims priority, application Germany, Apr. 28, 1967, 1642224
Int. Cl.² A01N *9/20*
U.S. Cl. 424—324 9 Claims

1. A method of controlling fungi of the class *Basidiomycetes* which comprises contacting fungi of the class *Basidiamycetes* with a fungicidally effective amount of a compound having the formula



in which R_1 denotes methyl, chloro, bromo, iodo, trifluormethyl, amino or nitro and R_2 denotes phenyl or cycloalkyl of 6-8 carbon atoms.

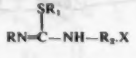
3,969,511

INSECTICIDAL, MITICIDAL AND LEPIDOPTERICIDAL ACTIVE ISOTHIURONIUM COMPLEX ACIDS AND FREE BASES

Llewellyn W. Fancher, Orinda, and Ashley H. Freiberg, Santa Clara, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 456,103, March 29, 1974, abandoned.
This application Nov. 15, 1974, Ser. No. 524,094
Int. Cl.² A01N *9/20*, *9/24*
U.S. Cl. 424—326 87 Claims

1. A method of controlling insects and mites consisting of applying to the insect or mite an insecticidal or miticidal amount of at least one compound having the formula



wherein R is selected from the group consisting of benzyhydryl and lower alkyl having from 5 to 8 carbon atoms; R_1 is selected from the group consisting of alkenyl, cycloalkyl and lower alkyl each having from 1 to 6 carbon atoms, methylthiomethyl, phenyl, benzyl, and methylbenzyl; R_2 is selected from the group consisting of alkenyl aryl, aralkyl, cycloalkyl and lower alkyl each having from 5 to 10 carbon atoms; methylthiomethyl, propyl and butyl and X is either an inorganic acid or is non-existing.

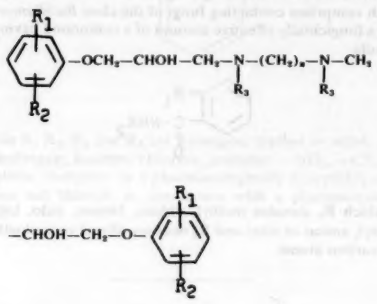
3,969,512

N,N'BIS-(3-PHENOXY-2-HYDROXY-PROPYL)-ALKYLENEDIAMINES AND SALTS THEREOF

Herbert Köppe; Helmut Stahle; Werner Kummer; Gojko Muacevic, and Werner Traunecker, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 336,269, Feb. 27, 1973, Pat. No. 3,888,898. This application Feb. 10, 1975, Ser. No. 548,366
Claims priority, application Germany, Mar. 6, 1972, 2210620; Dec. 11, 1972, 2260444
Int. Cl.² A61K 31/135; C07C 93/06
U.S. Cl. 424—330 11 Claims

1. A compound of the formula



wherein R_1 is allyl, allyloxy or chlorine,

R_2 is hydrogen or methyl,

R_3 is hydrogen, alkyl of 1 to 5 carbon atoms or benzyl, and

n is an integer from 2 to 6, inclusive,

provided, however, that when R_1 is allyl or allyloxy, R_2 is hydrogen; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

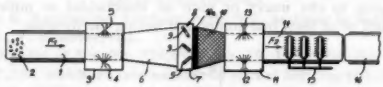
11. The method of blocking the β-adrenergic receptors and lowering the blood pressure of a warm-blooded animal in need of such treatment, which comprises perorally or parenterally administering to said animal an effective β-adrenergic receptor blocking and hypotensive amount of a compound of claim 1.

3,969,513

METHOD FOR CANDYING CHEWING-GUM SLABS

Jacques Edmond Marie Canonne, Geneva, Switzerland, assignor to Soreat S.A., Geneva, Switzerland

Filed Dec. 3, 1974, Ser. No. 529,116
Claims priority, application France, Oct. 22, 1974, 74.35454
Int. Cl.² A23G 3/00, 3/30
U.S. Cl. 426—5 4 Claims



1. A method for candying chewing-gum slabs comprising the steps of:

spraying the chewing gum slabs with eatable hot fluid;

coating the heated slabs with granulated confection sugar;

drying and cooling the coated slabs at a single drying tunnel; and

grouping the cooled coated slabs into packed units wherein individual slabs of gum are in direct contact with one another without sticking together.

3,969,514

COMBINATION FOOD PRODUCT HAVING DISCRETE PHASES OF NUT SPREAD AND OF A SECOND FOOD SPREAD

Peter J. Tiemstra, La Grange, Ill., assignor to Swift & Company, Chicago, Ill.

Filed July 17, 1974, Ser. No. 489,146
Int. Cl.² A23L 1/06, 1/36, 1/38
U.S. Cl. 426—90 11 Claims

1. A combination food product comprising a spreadable nut component phase, a second food spread phase of a marshmallow spread, a jelly, a jam, a preserve, or a marmalade, said second food spread phase having a normal water content between approximately 20 to 35 weight %, which corresponds to a water activity range of about 0.55 to 0.90, said spreadable nut component being an intimately mixed composition of minute particles of protein and carbohydrate suspended in an oil base, said spreadable nut component having water added thereto and thus a high water content of about 2% to 6% by weight thereof, which corresponds to a water activity range of about 0.40 to 0.70, a high oil content of about 55% to 65% by weight thereof, and a ground nuts content of about 60% to 90% by weight thereof, said high oil content and said high water content inhibiting the rate of moisture transfer from the second food spread phase into the spreadable nut component phase, said spreadable nut component phase being in contiguous contact with said second food spread phase and packaged as a combination food product wherein the spreadable nut component phase and the second food spread phase are discrete with respect to each other.

3,969,515

ANTIBIOTIC U-48,266

Alexander D. Argoudelis, and Fritz Reusser, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 10, 1975, Ser. No. 556,573
Int. Cl.² A61K 35/74
U.S. Cl. 424—118 2 Claims

1. Antibiotic U-48,266, which is active against *S. aureus*, *S. lutea* and *K. pneumoniae*, and which in its essentially pure form:

a. has the molecular formula $C_{17}H_{25}N_7O_5$

b. has the following elemental analysis: C, 50.16; H, 6.19; N, 24.09; O, 19.66;

c. has a specific rotation of $[\alpha]_D^{25} = -6.6°$ (c, 1, water);

d. is soluble in water and lower alcohols, for example, methanol and ethanol; is relatively insoluble in ketones, halogenated or saturated hydrocarbon solvents, ethyl acetate, or other ester-type solvents;

e. has a characteristic infrared adsorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings;

f. has a characteristic NMR spectrum as shown in FIG. 2 of the drawings;

g. has a typicla tlc pattern as shown in FIG. 3 of the drawings, or acid and base addition salts thereof.

3,969,516

COMPOSITION AND METHOD FOR TREATMENT OF ACNE

Richard B. Stoughton, Rancho Santa Fe, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Continuation-in-part of Ser. No. 533,617, Dec. 19, 1974, abandoned. This application July 7, 1975, Ser. No. 593,641
Int. Cl.² A61K 31/71
U.S. Cl. 424—181 9 Claims

1. A method for temporarily alleviating the signs and symptoms of acne comprising topically administering to humans suffering from acne an effective amount of a composition comprising about 0.1 to about 10 percent percent by weight of an antibiotic of the lincomycin family.

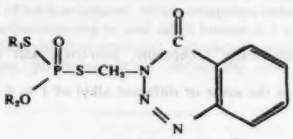
3,969,517

ASYMMETRIC O,S-DIALKYL DITHIOPHOSPHORIC ACID ESTERS OF 1,2,3-BENZOTRIAZIN-4-ONES

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 318,128, Dec. 26, 1972, Pat. No. 3,876,638. This application Jan. 29, 1975, Ser. No. 544,982
Claims priority, application Switzerland, Dec. 23, 1971, 18827/71; Nov. 22, 1972, 17011/72
Int. Cl.² A01N 9/36
U.S. Cl. 424—200 5 Claims

1. An insecticidal and acaricidal composition comprising (1) an insecticidally or acaricidally effective amount of a compound of the formula



wherein R_1 is N-propyl, isopropyl, n-butyl, isobutyl or sec-butyl, and R_2 is methyl or ethyl, and (2) a suitable carrier.

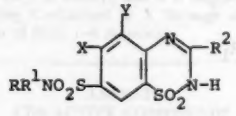
3,969,518

INHIBITING XANTHINE OXIDASE WITH 3-HALOALKYL SUBSTITUTED BENZOTHIADIAZINE-1,1-DIOXIDES

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 24, 1972, Ser. No. 256,224
Int. Cl. A61k 19/02
U.S. Cl. 424—246 17 Claims

1. A method for inhibiting the action of xanthine oxidase in a mammal having an elevated blood uric acid level by orally administering to said mammal a dose sufficient to lower the blood uric acid level to normal for that species of a xanthine oxidase inhibitor selected from the group consisting of structure I and structure II:



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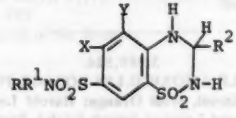


II

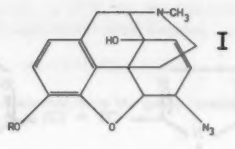
or sodium or potassium salt thereof wherein R represents hydrogen, C_{1-3} alkyl or allyl; R^1 represents hydrogen, C_{1-3} alkyl or allyl; X represents halogen or trifluoromethyl; Y represents hydrogen, chloro or bromo; and R^2 represents mono- or polyhalo C_{1-3} alkyl.

3,969,519

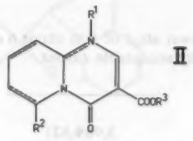
PHARMACEUTICAL COMPOSITION HAVING SYNERGISTIC ANALGESIC ACTIVITY AND CONTAINING AZIDOMORPHINE OR AZIDOCODEINE

József Knoll; Zsuzsanna Fürst; Zoltan Mészaros; Gábor Nagy; Ágoston Dávid, all of Budapest; Rezsö Bognár; Sándor Makleit, both of Debrecen, and Gyula Valovics, Tiszavasvari, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti, Budapest, Hungary

Filed Dec. 26, 1974, Ser. No. 536,402
Claims priority, application Hungary, Dec. 29, 1973, CI 1432
Int. Cl.² A61K 31/505, 31/485
U.S. Cl. 424—251 14 Claims

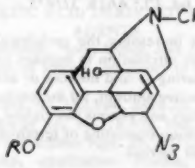


I

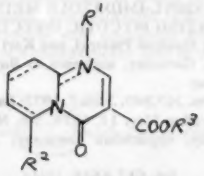


II

1. A pharmaceutical composition of synergistic analgesic effect which comprises in effective amounts at least one azido-compound of the formula



or its salt, wherein R is hydrogen or methyl and at least one homopyrimidazole compound of the formula:



wherein R^1 and R^2 are lower alkyl and R^3 is hydrogen or lower alkyl, and the dotted lines represent either double bonds or hydrogen atoms or a salt or pharmaceutically acceptable quaternary salt thereof in admixture with pharmacetically acceptable carriers or diluents.

3,969,520

2-AMINO-4[2-(1-LOWER ALKYL-5-NITRO-2-IMIDIAZOLYL)VINYL]PYRIMIDINES FOR TREATING PROTOZOAL AND BACTERIAL INFECTIONS

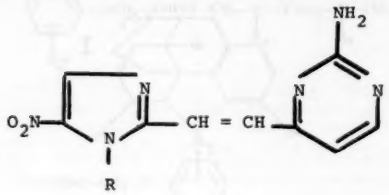
Aldo Garzia, Lodi (Milan), Italy, assignor to Istituto Chemioterapico Italiano S.p.A., Italy

Division of Ser. No. 364,025, May 25, 1973, Pat. No. 3,882,105, which is a continuation-in-part of Ser. No. 309,483, Nov. 24, 1972, abandoned. This application Nov. 6, 1974, Ser. No. 521,383

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **14 Claims**

1. A pharmaceutical composition for therapeutically treating a protozoal disease or bacterial infection in a living, warm-blooded animal body comprising an amount effective to combat the disease or infection of an active ingredient consisting essentially of a compound of the formula



wherein R is lower alkyl of 1 to about 6 carbon atoms and a pharmaceutically acceptable carrier.

3,969,521

PHARMACEUTICAL COMPOSITIONS CONTAINING TETRAHYDROALSTONINE AND METHOD FOR TREATING CIRCULATION DISORDERS

Jean-Claude Poignant, Bures-Sur-Yvette, France, assignor to Union et Cie, Societe Francasise de Recherche Medical, Suresnes, France

Filed Oct. 17, 1974, Ser. No. 515,785

Claims priority, application Germany, Aug. 18, 1975, 2439523

Int. Cl.[2] A61K *31/475*

U.S. Cl. 424—262 **3 Claims**

1. A method for increasing the peripheral blood flow in capillary and venous circulation in humans or animals which comprises administering to said humans or animals in need of said method an effective amount, for increasing the peripheral blood flow in capillary and venous circulation, of a compound selected from the group consisting of tetrahydroalstonine and an acid addition salt thereof.

3,969,522

DIARYL-PYRIDYL-IMIDAZOLE METHANES FOR TREATING MYCOTIC INFECTIONS

Wilfried Draber; Manfred Plempel, and Karl Heinz Büchel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

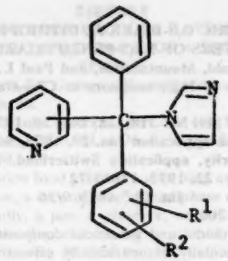
Division of Ser. No. 367,849, June 7, 1973, Pat. No. 3,910,936. This application Mar. 11, 1975, Ser. No. 557,354

Claims priority, application Germany, June 15, 1972, 2229128

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 **50 Claims**

25. A method of treating mycotic infections in humans and animals which comprises administering to a human or animal an antimycotically effective amount of a compound of the formula



or a pharmaceutically acceptable, non-toxic salt thereof wherein

R^1 and R^2 are the same or different alkyl of 1 to 4 carbon atoms.

3,969,523

ANTIPHLOGISTIC PHARMACEUTICAL COMPOSITIONS CONTAINING A 1-(NICOTINOYL OR ISONICOTINOYL)-3-BIPHENYLYL-ALKANONE-(2)

Josef Nickl; Helmut Teufel; Wolfhard Engel; Ernst Seeger, and Günther Engelhardt, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

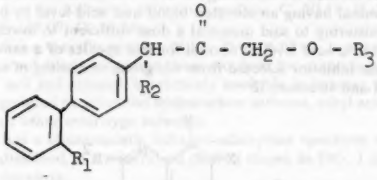
Division of Ser. No. 474,181, May 29, 1974, Pat. No. 3,920,668. This application Aug. 25, 1975, Ser. No. 607,667

Claims priority, application Germany, June 7, 1973, 2328973

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 **6 Claims**

1. An antiphlogistic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiphlogistic amount of a compound of the formula



wherein

R_1 is hydrogen fluoro or chloro,

R_2 is hydrogen or alkyl of 1 to 3 carbon atoms, and

R_3 is nicotinoyl or isonicotinoyl, or an optically active antipode thereof.

3,969,524

STABLE AMOXICILLIN DOSAGE FORM

Alexander S. Emodi, West Orange; Harold Leon Newmark, Maplewood, and Leonard Joseph Scialpi, Parsippany, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 13, 1974, Ser. No. 497,158

Int. Cl.[2] H61K *31/43*

U.S. Cl. 424—271 **6 Claims**

1. An injectable solution for intramuscular or intravenous administration containing 1.0–2.0 moles of anhydrous sodium carbonate per mole of amoxicillin free acid, said amoxicillin

being present in said solution in sufficient amount to provide from about 5% to 20% by weight of amoxicillin.

3,969,525

METHOD FOR REDUCING THE HEART BEAT FREQUENCY

Martin Wolf, Geisenheim, Johannisberg, Germany, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Jan. 16, 1975, Ser. No. 541,381

Claims priority, application Germany, Feb. 1, 1974, 24047549

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **1 Claim**

1. The method of slowing the heart rate in an adult human in need of such treatment, which comprises enterally or parenterally administering to said adult human 0.5 to 5 mgm of 2-(2',6'-diethylphenyl-amino)-1,3-diazacyclopentene-(2) or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

3,969,526

ANTHELMINTIC 5-HETEROCYCLIOTHIO AND OXY-2-CARBALKOXYAMINOBENZIMIDAZLES

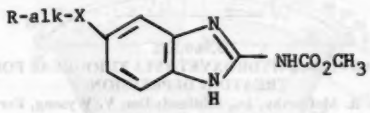
Robert J. Gyurik, West Brandywine, and William D. Kingsbury, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 364,841, May 29, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,781

Int. Cl.² C07D *405/12, 409/12*

U.S. Cl. 424—273 **11 Claims**

1. A chemical compound of the structure:



in which R is furyl or thienyl; and X is thio or oxy, said furyl or thienyl being C-attached to X through alk which is an alkylene chain of from 1–4 members.

3,969,527

CNS ACTIVE COMPOUNDS

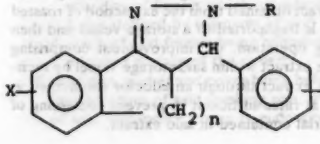
John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 28, 1975, Ser. No. 599,732

Int. Cl.² A61K *31/415*; **C07D** *231/54, 231/56*

U.S. Cl. 424—273 **22 Claims**

1. A compound of the formula



wherein X is a member selected from the group consisting of H, halogen, alkyl of from 1 to 8 carbons, lower alkoxy or CF_3; R is a member selected from the group consisting of H, lower alkyl, lower alkanoyl, phenyl, phenyl lower alkyl or hydroxy lower alkyl; *n* is 1, 2 or 3; B is a member selected from the group consisting of lower alkylamino, dilower alkylamino and alkylene is a straight or branched saturated hydrocarbon chain group containing from 2 to about 5 carbons; and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

3,969,528

HEXAHYDROIMIDAZO[1,5-A]PYRIDINES

John Lebeup Archibald; Alan Chapman White, both of Windsor, and Robin Michael Black, Porton, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

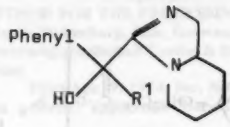
Filed Apr. 8, 1975, Ser. No. 566,632

Claims priority, application United Kingdom, Apr. 19, 1974, 17220/74

Int. Cl.² C07D *471/00*

U.S. Cl. 424—267 **4 Claims**

1. A compound selected from the group consisting of bases having the formula (I)



(I)

and the acid addition salts of said bases with pharmaceutically acceptable acids, wherein R^1 represents phenyl or phenyl substituted by one or more hydroxyl, lower alkyl, lower alkoxy, trifluoromethyl or halogen groups.

3,969,529

PHENOXYACETIC ACID DERIVATIVES AS DIURETIC AGENTS

Jean Jacques Godfroid, Noisy-le-Sec, and Jean Eugene Thuillier, Paris, both of France, assignors to C.E.R.P.H.A., Arcueil, France

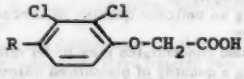
Continuation of Ser. No. 353,986, April 24, 1973, abandoned, which is a division of Ser. No. 78,976, Oct. 7, 1970, Pat. No. 3,758,506. This application Apr. 28, 1975, Ser. No. 572,311

Claims priority, application France, Oct. 10, 1969, 69.34760

Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **8 Claims**

1. A therapeutic composition in dosage form, particularly for increasing diuresis, which contains as active principle at least one phenoxyacetic acid compound selected from the group consisting of a phenoxyacetic acid of the formula



wherein R is 2-furyl keto, 2-thienyl keto or 2(5-methyl thienyl) keto, an alkali metal salt of said acid, and an addition salt of said acid with a pharmaceutically acceptable base together with a pharmaceutically acceptable diluent, said active principle being present in an amount of 0.050 to 1 g.

3,969,530

4-HYDROXY-3,5-DI-ALKYL-PHENYL-PROPIONIC ACID COMPOSITION SUITABLE AS LIPID LOWERING AND ANTI-DIABETIC AGENTS

Otto Mauz, Liederbach, Taunus, and Ernold Granzer, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

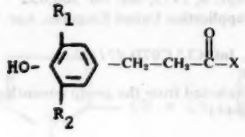
Filed Aug. 16, 1973, Ser. No. 389,004

Claims priority, application Germany, Aug. 18, 1972, 2240609

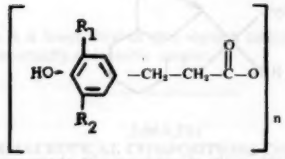
Int. Cl.[2] A61K *31/235*

U.S. Cl. 424—308 16 Claims

1. A pharmaceutical composition for lowering the lipid or blood sugar level comprising an effective amount for lowering the lipid or blood sugar level, in a unit dosage of 0.2 to 4 grams, of a 4-hydroxy-3,5-dialkyl-phenylpropionic acid or derivative thereof corresponding to formula I or II



I



II

wherein:

R_1 and R_2, which may be identical or different, is alkyl of 1 to 8 carbon atoms, R_3 is alkylene of 2 to 12 carbon atoms, X is hydroxy, alkoxy of 1 to 18 carbon atoms, phenalkoxy of 1 to 4 alkyl carbon atoms or cycloalkoxy of 5 to 8 carbon atoms, and *n* is an integer from 2 to 4, and a pharmacologically acceptable carrier therefor.

10. A method of treatment for lowering the lipid or blood sugar level by oral administration which comprises administering to a patient a unit dosage of 0.2 to 4 grams of the active compound in a composition as defined in claim 1.

3,969,531

METHOD FOR DISPENSING A SEMI-FROZEN COMESTIBLE

Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company

Continuation of Ser. No. 165,975, July 26, 1971, abandoned, which is a division of Ser. No. 866,861, Oct. 16, 1969, Pat. No. 3,642,174. This application Aug. 14, 1974, Ser. No. 497,298

Int. Cl.[2] A23G *9/20, 9/16, 9/28*

U.S. Cl. 426—319 5 Claims

1. A process for producing and dispensing a semi-frozen comestible, comprising:

a. providing an unfrozen quantity of concentrated natural fruit juice;

b. storing said concentrated juice under refrigeration;

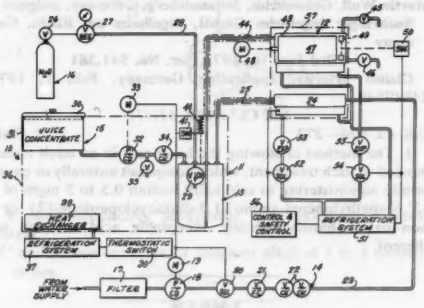
c. providing a quantity of pressurized nitrous oxide gas;

d. providing a quantity of water separate from said juice;

e. metering the concentrated juice while simultaneously separately regulating a flow of said water, and thereafter combining the metered juice and the flow-regulated water in an atmosphere charged with nitrous oxide gas under regulated pressure;

f. storing the resulting mixture under said regulated pressure of said gas under refrigerated non-freezing conditions;

g. transferring a portion of the stored mixture to a separate freezing chamber in response to the regulated pressure on the stored mixture;



h. lowering the temperature of said portion so as to freeze a predetermined proportion thereof under said regulated pressure as pure frozen water crystals dispersed in the unfrozen mixture; and

j. dispensing a serving of the comestible from said freezing chamber to atmospheric pressure to enable the dissolved nitrous oxide to break out of the liquid portion of the serving to render the serving fluffy.

3,969,532

1-ARYL-3-(2-HYDROXYETHYL) THIOUREAS FOR TREATING DEPRESSION

James R. McCarthy, Jr., Midland; Don V. Wysong, Farwell, and Bobbie J. Allen, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 438,927, Feb. 1, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,831

Int. Cl.[3] A61K *31/17*

U.S. Cl. 424—322 2 Claims

1. A composition for treating depression in a mammal comprising an effective anti-depressant amount of the compound 1-(2,4-dimethylbenzyl)-3-(2-hydroxyethyl)thiourea in combination with a suitable pharmaceutical carrier.

3,969,533

PROCESS FOR THE MANUFACTURE OF A SOLUBLE COFFEE PRODUCT

John G. Donnelly, Hasbrouck Heights, N.J., and George E. Livingston, Malverne, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 11, 1973, Ser. No. 423,862

Int. Cl.[2] A23F *1/08*

U.S. Cl. 426—432 7 Claims

1. In the process of manufacturing soluble coffee powder wherein coffee extract obtained from the extraction of roasted and ground coffee is transported to a storage vessel and then passed to a drying operation, the improvement comprising agitating the coffee extract within said storage vessel by recirculating the coffee extract through an eductor submerged in the coffee extract at rates sufficient to prevent coalescing of the insoluble material contained in said extract.

3,969,534

SHELF-STABLE LOW-FAT BIOLOGICALLY FERMENTED DAIRY PRODUCT

Robert L. Pavey, Western Springs, and Patrick E. Mone, Oak Lawn, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,590
Int. Cl.² A23C 9/12
U.S. Cl. 426—34 12 Claims

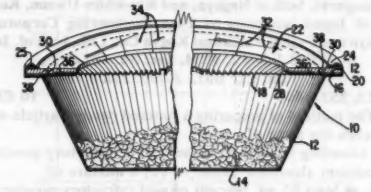
1. A process for producing a shelf-stable cultured low-fat dairy product comprising: a first pasteurization step by heating a low-fat dairy base; biologically fermenting said dairy base; mixing in a starch stabilizer; heating the mixture to a syneresis temperature high enough to promote syneresis and low enough to avoid both pasteurization and setting of the mixture; maintaining the syneresis temperature until appreciable syneresis is accomplished, said syneresis temperature being within the approximate range of 100° to 150°F.; thereafter homogenizing the mixture to restructure same into a uniform, flowable, preset product; flowing the preset product in preparation for a canning step; accomplishing a second pasteurization step at a temperature of approximately 170° to 200°F., said secnd pasteurization step also serving to initiate setting of the present product; and permitting final setting of the flowable present product in a container to produce a cultured low-fat dairy product that has a room temperature shelf stability of at least 6 months.

3,969,535

POPCORN PACKAGE

George B. Bourns, La Porte, Ind., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 4, 1974, Ser. No. 430,866
Int. Cl.² A23L 1/18
U.S. Cl. 426—111 6 Claims



1. A package for storing and preparing an expansible food stuff comprising in combination:

A. A cooking pan;

B. A food stuff disposed in said pan;

C. An expansible cover closing the upper surface of said pan;

D. A gasket disposed adjacent to said cover;

1. Said gasket further comprising an annulus, the outer surface of said annulus being substantially coextensive with the outer surface of said pan and said cover; the inner diameter of said annulus being substantially smaller than the outer diameter of said pan;

2. An annular score formed in said gasket between said inner diameter and said outer diameter and extending partly through said gasket from the pan side;

3. A plurality of straight scores extending from the inner diameter of said gasket to said annular score completely through said gasket material and defining a plurality of fingers which are adaptable to flex about a hinge defined by segments of said annular score;

4. Each of said fingers being adhesively connected to the adjacent surface of the cover;

E. Said pan, gasket and cover being held together by crimping the edges of said cooking pan, whereby the integrity of said expansible cover is maintained, retaining steam generated during heating and improving the degree and extent of expansion of the expansible food stuff.

3,969,536

METHOD FOR PREPARING JELLY FOODS

Terukazu Ikeda, Tokyo; Shintaro Moritaka, Kobe; Satohiko Sugiura, and Tsutomu Umeki, both of Kawasaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka and Nichiro Gyogyo Kaisha, Ltd., Tokyo, both of, Japan

Filed Apr. 8, 1975, Ser. No. 566,518
Claims priority, application Japan, Apr. 9, 1974, 49-40565
Int. Cl.² A23L 1/04
U.S. Cl. 426—103 6 Claims

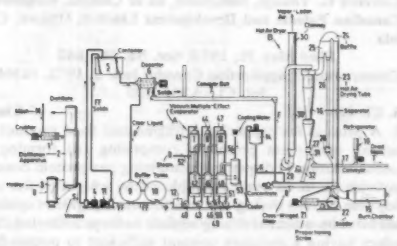
1. A method for preparing a jelly food, which comprises (1) separately preparing at least two mixtures each of which contains from 0.5 to 5 weight % of a thermally gelable polysaccharide predominantly composed of β-1,3-glycosidic groups, (2) separately maintaining each of the mixtures within the temperature range of from 55° to 80°C under stirring to disperse the polysaccharide in each of the mixtures, (3) assembling the resultant mixtures in a manner such that each mixture is independent from each of the other mixtures but in intimate contact with at least one of the other mixtures, (4) heating the resultant assembly to a temperature not less than 60°C, and (5) cooling the heated assembly.

3,969,537

METHOD FOR THE PROCESSING OF VINASSE

Hans-Martin Stoltenburg, Selk, Germany, assignor to Kartoffelverwertungsgesellschaft Cordes & Stoltenburg, Schleswig, Germany

Filed Apr. 9, 1974, Ser. No. 459,276
Claims priority, application Germany, Apr. 13, 1973, 2318751
Int. Cl.² A23B 4/04
U.S. Cl. 426—464 5 Claims



1. A method of processing potato vinasse comprising the steps of:

a. crushing a fermented potato mash whereby the dangers of heat crusting and clogging are reduced to a minimum;

b. distilling the crushed potato material by indirect heating to obtain a bottoms residue of potato vinasse;

c. fractionating the potato vinasse by decanting the same to simultaneously convert the vinasse into clear liquid with a very minimal content of undissolved solids, and solids with high degree of dehydration and removing the solids therefrom;

d. exiting the clear fractionated liquid from the decantation zone, and running the same free-fall into a lower buffer zone to separate sediment from the clear flow fractionated liquid and recycling the sediment to the decantation zone;

e. thereafter thickening the clean fractionated liquid from the buffer zone by multiple effect vacuum downfall vaporization to form a concentrate;

f. cross-winged mixing the concentrate with the potato solids from the decantation zone;

g. drying the mixture of step (f) by a two-stage hot-air drying system, whereby rapid drying is accomplished; and

h. separating solids from step (g) and returning a portion thereof to step (f) for mixing therein.

3,969,538

RECOVERY OF ENZYMES WITH ION EXCHANGERS

Dieter Schwengers, Dormagen; Hans Georg Schneider, Euskirchen, and Ingrid Keller, Monchengladbach, all of Germany, assignors to Pfeiffer and Langen, Cologne, Germany

Filed Jan. 16, 1975, Ser. No. 541,670

Claims priority, application Germany, Jan. 17, 1974, 2402226; Aug. 21, 1974, 2439989

Int. Cl. C07g 7/02; A23c 9/14

U.S. Cl. 426—491 18 Claims

1. A process for separating enzymes from an aqueous solution in which they are mixed with smaller organic molecules, comprising passing the solution through an ion exchange resin, eluting the resin with water, and separating an enzyme-rich fraction before the appearance of a fraction of the eluate containing the samller organic molecules.

17. The process of claim 3, wherein the aqueous solution is milk and the eluate is successively divided into an enzyme-rich fraction and then a lactose-fraction.

3,969,539

PROCESS FOR PREPARING SYNTHETIC FOOD PRODUCTS

Arthur K. Sumner, Saskatoon; Linda M. Leinan, St. Jean, and Clarence G. Youngs, Saskatoon, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 31, 1973, Ser. No. 365,662

Claims priority, application Canada, June 2, 1972, 143692

Int. Cl.² A23J 3/00

U.S. Cl. 426—641 17 Claims

1. A process for preparing a fragmented food product for admixing with meat products, comprising (a) forming an aqueous solution or dispersion containing pea protein concentrate with up to 40 percent edible oil by weight of the total solids plus oil, (b) drying the solution or dispersion rapidly in sheet form on a heated drying surface to form a sheeted dried product having a moisture content sufficient to permit fragmenting, (c) fragmenting said sheeted product prior to rehydration thereof and (d) thereafter rehydrating the fragmented product to a moisture content of at least about 50 percent to form said fragments suitable for admixing with meat products.

3,969,540

ENZYMATICALLY PREPARED METAL PROTEINATES

Ned L. Jensen, Layton, Utah, assignor to Albion Laboratories, Inc., Clearfield, Utah

Filed Sept. 11, 1975, Ser. No. 612,371

Int. Cl.² A23J 1/02

U.S. Cl. 426—657 4 Claims

1. A composition of matter comprising naturally occurring proteinaceous tissues selected from the group consisting of muscle, heart, liver, thymus, brain, spleen, kidneys, duodenum, pancrease, and orchic a portion of which have been enzymatically hydrolyzed by a protease to produce polypeptides; said polypeptides being chelated with bivalent biologically essential metals to form metal proteinates.

3,969,541

DIFFUSION TRANSFER IMAGE RECEPTIVE MATERIALS

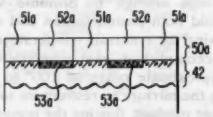
Yoshito Mukaida; Eiichi Mizuki; Tomoaki Ikeda; Masayoshi Tsuboi; Akio Ishizuka, and Fumiaki Shinozaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 27, 1972, Ser. No. 238,228

Claims priority, application Japan, Mar. 26, 1971, 46-18122

Int. Cl.³ G03C 5/54

U.S. Cl. 427—400 15 Claims



1. A process for producing a diffusion transfer image receptive sheet comprising an alkali impermeable polymer, which process comprises contacting a surface portion of said alkali impermeable polymer with a solution containing both diffusion transfer nuclei and at least one material which is capable of converting the alkali impermeable polymer into an alkali permeable state to simultaneously make said surface portion of said alkali impermeable polymer alkali permeable and incorporate therein diffusion transfer nuclei.

3,969,542

CATALYSTS AND METHODS OF MAKING

Tadayoshi Tomita, Yokohama; Mikio Noda; Yoshinobu Yamaguchi, both of Nagoya, and Kin-ichiro Uwano, Kariya, all of Japan, assignors to Toyo Engineering Corporation, Tokyo and Fujimi Kenmazai Kogyo Co., Ltd., both of, Japan

Filed July 12, 1974, Ser. No. 487,892

Int. Cl.³ B01J 29/00, 23/08

U.S. Cl. 252—457 10 Claims

1. The method of preparing a sintered catalyst article which comprises the steps of

(I) kneading with water either (a) a refractory powder of calcium aluminate alone, or (b) a mixture of

1. at least 25 wt. percent of said refractory powder and

2. the balance is at least one member selected from the group consisting of aluminum oxide, calcium oxide, beryllium oxide, magnesium oxide, strontium oxide and a compound which is converted by heating to one of said oxides,

wherein (a) and (b) contain less than 0.2 wt. percent of silicon dioxide, less than 3.0 wt. percent of other metal oxides and the other ingredients are present in amounts effective to provide a sintered catalyst article having the composition set forth hereinbelow:

II. molding the kneaded material into a shaped article;

III. placing the shaped article in a vessel, closing the vessel and aging said shaped article in said closed vessel for at least one day while preventing evaporation of water to obtain a shaped article having a crushing strength of at least about 120 Kg/cm²;

IV. drying the shaped article at a low temperature to remove uncombined water; and then

V. sintering the shaped article at a temperature above 1150°C; the thus sintered catalyst article consisting of 10 to 60 wt. percent of calcium oxide, 30 to 90 wt. percent aluminum oxide 0 to 30 wt. percent of at least one oxide selected from the group consisting of beryllium oxide, magnesium oxide and strontium oxide, less than 0.2 wt. percent of silicon dioxide and less than 3.0 wt. percent of other metal oxides.

3,969,543

METHOD OF PROVIDING A PATTERNED LAYER OF SILICON-CONTAINING OXIDE ON A SUBSTRATE

Edward David Roberts, Purley, England, and Jan Frederik Steggerda, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,493

Claims priority, application United Kingdom, Oct. 1, 1973, 45771/73

Int. Cl.² B05D *3/06*

U.S. Cl. 427—54 **15 Claims**

1. A method of providing a patterned silicon containing oxide layer on a substrate, said method comprising applying a coating comprising a polymerizable cyclosiloxane containing methyl groups bonded to silicone and an ultra-violet sensitive sensitizer capable of being converted to a basic reacting form capable of promoting polymerization of the polymerizable cyclosiloxane to an insoluble state in a solvent for the polymerizable cyclosiloxane, exposing desired areas of said coated substrate to ultra-violet radiation to thereby cause polymerization of the polymerizable cyclosiloxane to an insoluble state, treating said surface with a solvent capable substantially only of dissolving unexposed polymerizable cyclosiloxane and then converting the polymerized cyclosiloxane to a silicon containing oxide.

3,969,544

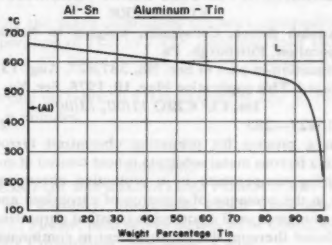
METHOD FOR PLATING METALLIC WORKPIECES, PARTICULARLY ALUMINUM

Edward G. Obeda, Brookfield, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Feb. 14, 1975, Ser. No. 549,894

Int. Cl.² B23K *35/12*

U.S. Cl. 427—57 **8 Claims**



1. A method of applying a tin plating upon an aluminum workpiece comprising the steps of:

maintaining a pool of molten tin at a temperature of at least 300°C for causing an alloy to be formed between the aluminum workpiece and the tin;

disposing the aluminum workpiece in said pool for a period of time sufficient for causing the surface of the workpiece to attain said temperature, and

providing high frequency vibratory energy in the sonic or ultrasonic frequency range to said pool while said workpiece is disposed in said molten tin.

3,969,545

LIGHT POLARIZING MATERIAL METHOD AND APPARATUS

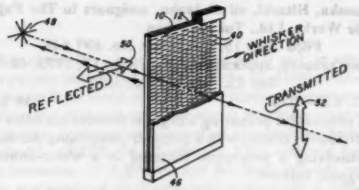
Robert E. Slocum, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 337,046, March 1, 1973, abandoned. This application Nov. 19, 1974, Ser. No. 525,232

Int. Cl.² C23C *13/02*

U.S. Cl. 427—163 **17 Claims**

1. The process of making light polarizers comprising directing in a vacuum a vaporized metallic material which is reflective at the wavelength to be polarized directly onto a microscopically smooth surface that whiskers formed of said material are grown on said surface with their long axis essentially parallel to the vaporized material direction and the projections of said long axis on said surface are essentially parallel.



3,969,546

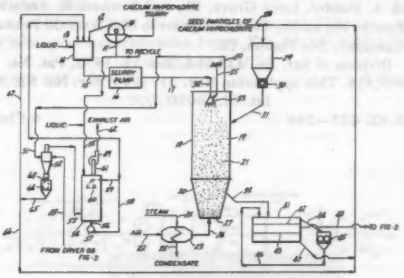
PROCESS FOR PREPARING GRANULAR CALCIUM HYPOCHLORITE IN A FLUIDIZED BED

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, July 31, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,931

Int. Cl.² C01B *11/06*

U.S. Cl. 427—213 **19 Claims**



1. A method for preparing particulate solid calcium hypochlorite having a smooth rounded surface from a pumpable and sprayable aqueous slurry of calcium hypochlorite which comprises:

a. maintaining a moving bed of particulate solid calcium hypochlorite containing from about 5 to about 30 percent by weight of water in a fluidized bed having an upper part and a lower part,

b. maintaining a temperature in said fluidized bed in the range from about 40° to about 70°C.,

c. lifting a portion of said moving bed with a flowing stream of gas to said upper part and releasing said particles by gravity to separately fall through said fluidized bed to said lower part,

d. spraying on said falling particles a pumpable and sprayable aqueous slurry of calcium hypochlorite containing from about 45 to about 90 percent by weight of water,

e. simultaneously evaporating and removing water from said slurry on said falling particles whereby said particles are coated with a layer of solid calcium hypochlorite, and the water content is from about 5 to about 30 percent by weight, and

f. removing at least a portion of the resulting coated smooth rounded calcium hypochlorite particles from said lower part of said fluidized bed.

3,969,547

PROCESS OF PREPARING POLYMER-COATED POWDER PARTICLES

Kazuo Isawa; Takayoshi Usuki, both of Tokyo, and Hideo Nagasaka, Hitachi, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Aug. 15, 1974, Ser. No. 497,648
Claims priority, application Japan, Aug. 17, 1973, 48-92163
Int. Cl.² B05D 7/00, 3/00
U.S. Cl. 427—214 10 Claims

1. A process for preparing inorganic powder particles which are individually coated with a polymer comprising the steps of:

a. dissolving a polymeric material in a water-immsicible organic solvent;

b. float-dispersing an inorganic powder particles in the resulting solution, the surface of the particles having been treated with an activator selected from the group consisting of hydrogen peroxide, phosphate, and chromate, or a surface treating agent selected from the group consisting of aliphatic acids, amine compounds, and alkoxy silanes or both to make the surface of the particles compatible with the polymeric material;

c. slowly adding to the resulting dispersion an aqueous solution of a hydrophilic protective colloid;

d. removing the water-immiscible organic solvent from the resulting emulsifying liquid; and

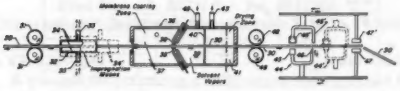
e. washing and drying the thus obtained individually coated particles.

3,969,548

METHOD FOR FORMING A SEMI-PERMEABLE STRIP

Jack A. Hunter, Long Grove, Ill., and Kenneth E. Anderson, Rancho Bernardo, Calif., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 323,614, Jan. 15, 1973, Pat. No. 3,909,418. This application Nov. 21, 1974, Ser. No. 525,909
Int. Cl.² B05D 5/00
U.S. Cl. 427—244 6 Claims



1. A continuous method for forming a member suitable for stacking and for separating the constituents of a fluid feed material which can be passed over the member, which comprises:

a. moving a thin, elongated strip of porous filler material through an impregnation zone and effecting penetration with a fluid seal material through spaced sections of said strip, whereby there can be no subsequent fluid flow therethrough;

b. continuing to draw said strip through a coating zone and into contact with a membrane forming coating solution to form a semi-permeable membrane on each side of said strip;

c. passing the thusly coated strip into a controlled temperature drying zone, thereby forming a resulting strip with spaced, sealed sections;

d. cutting at least one hole in said strip through the spaced and sealed sections; and

e. additionally, transversely cutting said elongated strip through the spaced and sealed sections at a spaced distance from any holes therein to provide resulting separate strips each of which has fluid sealing material through the porous filler for both end portions thereof and a fluid passageway hole through one end portion thereof.

3,969,549

METHOD OF DEACIDIFYING PAPER

John C. Williams, Alexandria, Va., and George B. Kelly, Jr., Gaithersburg, Md., assignors to The United States of America as represented by the Librarian of Congress, Washington, D.C.

Filed Dec. 24, 1974, Ser. No. 536,125
Int. Cl.² C23C 13/04
U.S. Cl. 427—248 9 Claims

1. A method of deacidifying cellulosic paper by first impregnating said paper with the vapors of a volatile organo-metallic compound wherein said compound is volatile at temperatures up to about 150°C; does not discolor said paper; does not interact with inks used in books; and is readily reactive with acids; and subsequently hydrolyzing said compound to an alkaline material in situ by exposing said paper to a gaseous hydrolyzing environment.

3,969,550

CHROMIZING PROCESS USING COLUMBIUM AS STABILIZER

Carl Adolph Beiser, Coraopolis, assignor to National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 387,627, Aug. 13, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,177
Int. Cl.² C23C 11/00, 13/00
U.S. Cl. 427—253 21 Claims

1. In a process for preparing chromized ferrous metal wherein a ferrous metal substrate is heat treated at an elevated chromizing temperature in a protective chromizing atmosphere in the presence of a source of chromium and a chromizing energizer until a corrosion resistant chromized coating is produced thereon, the improvement in combination therewith which comprises employing as the said ferrous metal substrate a plain low carbon columbium treated steel substrate initially having a total carbon content of at least 0.03% and containing about 0.03–0.15% of columbium, the carbon content of the steel being partially stabilized by the columbium whereby a portion of the carbon content is free to diffuse upon heating the steel substrate to the said elevated chromizing temperature, the steel substrate being heat treatable at the said elevated chromizing temperature in the protective chromizing atmosphere in the presence of the source of chromium and the chromizing energizer to produce a carbon-containing chromized coating thereon having a metallographically measured thickness of about 1–3 mils, the said chromized coating containing about 0.2–1% carbon from the steel substrate which is free to diffuse, and the said carbon content which is free to diffuse, the columbium content and the thickness of the steel substrate being correlated to satisfy the equation

$$A = Y \times Z,$$

where A is the percent carbon content of the said chromized coating and varies between 0.2 and 1%, Y is the percent carbon content of the steel substrate which is free to diffuse and is determined by the following equation

$$\%\text{Diffusible Carbon} = \%\text{Total Carbon} - 0.01\% \left[\frac{\%\text{Columbium Content}}{8} + \frac{0.0\%}{1} \right]$$

and Z is a multiplication factor determined by the equation

$$\text{Multiplication Factor} = \frac{\text{The steel substrate thickness in mils}}{\text{The total chromized coating thickness of the steel substrate in mils}}$$

where the total chromized coating thickness of the steel substrate is equal to twice the metallographically measured diffusion layer of the said chromized coating plus one mil.

3,969,551

CHEMICALLY SCULPTURING FABRICS

Robert E. Ellsworth, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 5, 1974, Ser. No. 486,142
Int. Cl.² B05D *5/00*
U.S. Cl. 427—282 **12 Claims**

1. A process for manufacturing a sculptured decorative finish on a textile fabric which comprises:

i. applying a dispersion of an aqueous polyurethane latex composition having a viscosity of from 15,000 to 90,000 cps obtained by adding an isocyanate-terminated polyurethane prepolymer having pendant carboxyl groups to water containing a tertiary aliphatic amine and allowing chain extension with water to proceed until all of the isocyanate groups have been reacted to the fabric by gravure rolls, flat screens or rotary screens in a pattern and

ii. drying the fabric containing the latex composition at a temperature of 140° to 230°F. until internally tacky,

iii. passing the fabric through a system of heated nip rolls, and

iv. redrying the fabric at a temperature of 220° to 305°F. for 2 to 6 minutes.

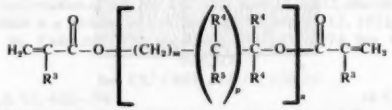
3,969,552

PROCESS FOR IMPREGNATING POROUS ARTICLES

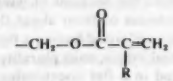
Bernard M. Malofsky, Bloomfield; Elliott Frauenglass, and Harold A. Fowler, both of Newington, all of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed May 8, 1974, Ser. No. 467,989
Int. Cl.² B08B *7/00;* **C23D** *17/00;* **B05D** *3/00*
U.S. Cl. 427—295 **37 Claims**

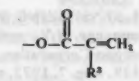
6. An impregnation process comprising the steps of (a) impregnating a porous metal article with a polymerizable anaerobic sealant wherein at least a portion of the polymerizable anaerobic sealant has the formula



wherein R^4 represents a radical selected from the group consisting of hydrogen, lower alkyl of from 1 to about 4 carbon atoms, hydroxy alkyl of from 1 to about 4 carbon atoms, and



R_5 is a radical selected from the group consisting of hydrogen, halogen and lower alkyl of from 1 to about 4 carbon atoms; R^3 is a radical selected from the group consisting of hydrogen, hydroxyl and



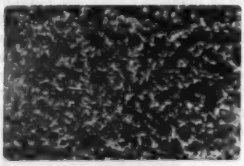
m is 0 to about 12, n is at least 1, and p is 0 or 1; in admixture with a peroxy initiator of the cure of the anaerobic sealant; (b) removing at least some of the polymerizable anaerobic sealant remaining on the surface of the metal article by treating said surface with an aqueous solution of a surfactant having the formula $X^1—O(C_2H_4O)_xX^2$ wherein X^1 is selected from the group consisting of A,R^1—A, and R^2, and carbonyl, wherein A is an aryl group of a halogen- and/or lower alkyl-substituted aryl group; R^1 is a branched alkyl group containing about 3–12 carbon atoms or a linear or cyclo akyl group containing about 1–20 carbon atoms; R^2 is a linear or cyclo alkyl group containing about 4–20 carbon atoms; X^2 is X^1 or H; and x is between five and about 100 when X^2 is H but between about seven and about 100 when X^2 is X^1; and (c) permitting the anaerobic sealant to cure.

3,969,553

METHOD OF MANUFACTURING A METAL-IMPREGNATED BODY

Katsumi Kondo; Fumiyoshi Noda, both of Toyota; Kunihiko Uchida, Okazaki, and Yoshihiro Tsuzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 11, 1974, Ser. No. 441,227
Claims priority, application Japan, Feb. 13, 1973, 48-17795
Int. Cl.² B22F *3/26*
U.S. Cl. 427—299 **8 Claims**



1. A method of manufacturing a nitride ceramic impregnated with a molten metal comprising the steps of treating a porous shaped or powdered nitride ceramic with a liquid or solution containing a compound having an OH radical, said solution or liquid selected from the group consisting of water or an aqueous solution of methanol, ethanol, butanol, acetone, acetic acid, or ammonium hydroxide, drying said ceramic to expose an active ceramic surface, molding said ceramic into a solid body before it is impregnated with a molten metal and impregnating said ceramic with a molten metal which remains in substantially uncombined form after impregnation.

3,969,554

PRECIOUS METAL SENSITIZING SOLUTIONS

Rudolph J. Zeblisky, Hauppauge, N.Y., assignor to Photocircuits Division of Kollmorgan Corporation, Glen Cove, N.Y.

Division of Ser. No. 278,429, Aug. 7, 1972, abandoned, and a continuation-in-part of Ser. No. 9,060, Feb. 5, 1970, Pat. No. 3,682,671, which is a continuation-in-part of Ser. No. 801,167, Feb. 20, 1969, Pat. No. 3,672,938, which is a continuation-in-part of Ser. No. 712,575, March 12, 1968, abandoned, which is a continuation of Ser. No. 551,249, May 19, 1966, abandoned, which is a continuation of Ser. No. 285,889, June 6, 1963, abandoned, which is a continuation of Ser. No. 53,352, Sept. 1, 1960, abandoned. This application Dec. 11, 1974, Ser. No. 531,725

Int. Cl.[2] B05D *3/04, 3/10*

U.S. Cl. 427—305 12 Claims

1. A process for sensitizing a substrate to be plated with an adherent electroless metal which comprises cleaning said substrate and contacting the cleaned substrate with a sensitizing solution for the sensitization of conductive and non-conductive surfaces to the reception of adherent electroless metal which comprises from about 0.01 grams to about 5.0 grams per liter of precious metal ions; an excess of a stoichiometric amount of an ion of a Group IV metal which is capable of two valence states; and a stabilizing amount, at least sufficient to prevent separation from said solution of said precious metal as a metallic film or precipitate, of a Lewis Base selected from the group consisting of hydroxylamine, ammonia and aniline.

3,969,555

ALUMINUM PLATING CORROSION RESISTANCE

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 30, 1972, Ser. No. 239,959

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—383 6 Claims

1. In a process for the plating of aluminum onto a substrate comprising sequentially contacting an aluminum hydride and a decomposition catalyst selected from the group consisting of a compound of titanium, zirconium, hafnium, vanadium, niobium and tantalum, in the presence of each other, with the substrate for a time sufficient to deposit metallic aluminum onto the substrate, the improvement consisting of subsequently heat treating at least the deposited metallic aluminum at a temperature of from about 50° to about 150°C. and for a time sufficient to improve the corrosion resistance of the deposited metallic aluminum.

3,969,556

WHIPPED WAX BASE DISPLAY

Doris Sweeney, 512 A Taylor Ave., Warrington, Pa. 18476, and Mary Ellen Lee, 7951 Anita Drive, Philadelphia, Pa. 19111

Filed Jan. 2, 1975, Ser. No. 537,968

Int. Cl.[2] B44C *3/04*

U.S. Cl. 428—13 7 Claims

1. A visual display comprising:
1. a transparent container in which is
2. a solid whipped wax mold shaped to the contours of said container, the surface of which has a whipped appearance and into which has been set
3. one or more objects for the purpose of creating a visually pleasing effect.

3,969,557

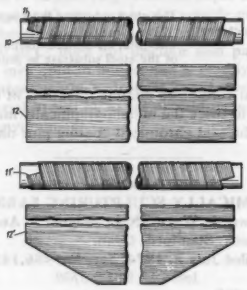
FIBERGLASS VAULTING POLE

Herbert R. Jenks, Carson City, Nev., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,604

Int. Cl.[2] B32B *3/20;* B65H *81/00*

U.S. Cl. 428—36 3 Claims



1. An elongated and hollow vaulting pole having at least three layers of fiberglass which are bonded together, two of said layers comprising fiberglass tape extending the length of said pole in a succession of butt-jointed helical turns, said tape having the fibers thereof oriented primarily lengthwise of said tape, the turns of one of said two layers being oriented crosswise of the turns of the other of said two layers, and the third of said three layers being positioned between said two layers and comprising a plurality of turns of fiberglass cloth extending the length of said pole, said cloth having the fibers thereof oriented primarily lengthwise of said pole.

3,969,558

VENEER SHEET OF A PLURALITY OF THIN FLAT SECTIONS OF WOOD

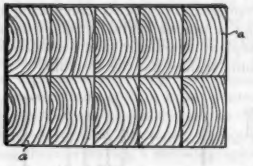
Takeshi Sadashige, Fuchu, Japan, assignor to Dantani Plywood Co., Ltd., Kitakyushu and Sadashige Fancy Plywood Industries Co., Ltd., Fuchu, both of, Japan

Division of Ser. No. 379,962, July 17, 1973, Pat. No. 3,878,016. This application Sept. 23, 1974, Ser. No. 508,366

Claims priority, application Japan, July 18, 1972, 47-72230

Int. Cl.[2] B32B *3/14, 21/14, 31/18;* B27D *1/10*

U.S. Cl. 428—58 6 Claims



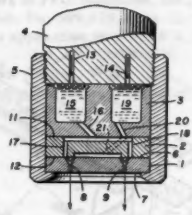
1. A sheet of veneer suitable to be affixed to a substrate comprising a plurality of thin flat sections of wood, each of said thin sections of wood comprising a portion of a flitch obtained from a log, said flat sections of wood having a substantially constant thickness of from about 0.1 mm to about 0.8 mm, said flat sections of wood having a flat front and a flat back bounded by lateral edges, said plurality of flat sections of wood being arranged in a flat coextensive array with said lateral edges abutting one another and adhesive means joining said abutting edges of said plurality of flat sections of wood to form said sheet of veneer.

3,969,559

MAN-MADE TEXTILE ANTISTATIC STRAND

Norman Wendell Boe, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed May 27, 1975, Ser. No. 581,397
Int. Cl.² D02G 3/00; D03D 27/00
U.S. Cl. 428—87 11 Claims



1. A novel biconstituent filament useful for dissipating static electricity from normally static prone textile articles comprising a first constituent substantially adhered lengthwise to a second constituent, the first constituent being made of a non-conductive synthetic thermoplastic fiber-forming polymer, the second constituent being a normally non-conductive synthetic thermoplastic fiber-forming polymer rendered electrically conductive by having dispersed substantially uniformly throughout a sufficient quantity of electrically conductive carbon black to provide an electrical resistance of less than 1×10^{10} ohms per centimeter at a direct current potential of 0.1 volt, the cross-sectional area of the second constituent comprising from about 1 to 30 percent of the cross-sectional area of the filament, and the first constituent partially encapsulating the second constituent in an amount of at least 50 percent and forming a curvate interface therewith extending from one side to the other side of the filament.

3,969,560

COPOLYMERS OF MONOUNSATURATED OR DIUNSATURATED POLYESTERS WITH VINYL MONOMERS

Sheldon N. Lewis, Willow Grove, and John J. Miller, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 262,382, June 13, 1972, abandoned, which is a division of Ser. No. 18,290, March 13, 1972, Pat. No. 3,681,108. This application Nov. 29, 1974, Ser. No. 528,186
Int. Cl.² C08F 218/14, 220/20
U.S. Cl. 428—90 10 Claims

1. A substantially gel-free resinous copolymer of:

I. an ethylenically unsaturated addition-polymerizable polyester having an average of from one to two double bonds in each molecule, of

1. an ethylenically unsaturated addition-polymerizable carboxylic acid,
2. a saturated or aromatic polycarboxylic acid having no polymerizable double bonds, and
3. a polyol and

II. at least one vinyl monomer, and comprising an alkyl ester of acrylic acid or methacrylic acid, the weight ratio of I:II being between 0.5:99.5 and 40:60.

3,969,561

BIAXIALLY ORIENTED NONWOVEN FABRICS AND METHOD OF MAKING SAME

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Sept. 17, 1974, Ser. No. 506,843
Int. Cl.² B32B 5/12
U.S. Cl. 428—113 8 Claims

1. A biaxially oriented nonwoven fabric of textile-length fibers comprising:

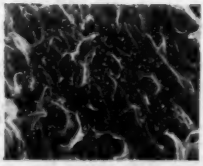
an unlayered nonwoven web having adjacent areas of low fiber density and areas of high fiber density thereon, a majority of the fibers in said low fiber density areas having a particular configuration and being uniformly distributed therein and oriented in a direction substantially normal to the axis of said configuration and, a majority of the fibers in the high fiber density area that lies directly adjacent said low fiber density areas being uniformly distributed therein and oriented in a direction substantially parallel with the contours of said configuration of the low fiber density area.

3,969,562

POROUS POLYMER FILM

Takashi Suzuki, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 24, 1974, Ser. No. 536,116
Claims priority, application Japan, Dec. 28, 1973, 49-2853
Int. Cl.² D06N 3/04
U.S. Cl. 428—155 6 Claims



1. A plane-oriented, open porous film consisting of 100 parts by weight of crystalline high molecular material and 1 to 300 parts by weight of material having a lower melting point than that of said crystalline high molecular material, said film including a number of fine flat voids extending in the rectangular direction of the thickness in the film and fine arcshaped fiber structures on the surface thereof wherein said surface fiber has a mean diameter of 0.01 to 50 microns, the voids have a void mean diameter along the plane of 0.1 to 100 microns, and having a void content in the direction of the thickness of 10 to 10,000/mm.

3,969,563

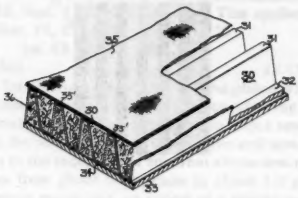
PROTECTIVE WALL STRUCTURE

Russell E. Hollis, Sr., 213 Fenwick Drive, New Carlisle, Ohio 45344

Continuation-in-part of Ser. No. 853,811, Aug. 28, 1969, Pat. No. 3,764,277, which is a continuation of Ser. No. 460,309, June 1, 1965, abandoned. This application Oct. 4, 1972, Ser. No. 294,903

Int. Cl.[2] B32B *3/12*; F41H *5/04*; B32B *3/28*

U.S. Cl. 428—175 13 Claims



1. A protective wall structure comprising spaced wall elements including an inner wall element and an outer wall element, said outer wall element being metallic and said inner wall element comprising a multi-layer cloth material, rigidifying means formed of a material selected from the group consisting of precipitation hardened stainless steel, mar-aging nickel steels, alloy steels and titanium alloys having a yield strength of at least about 200 ksi, said rigidifying means being positioned between and contacting said wall elements and forming therewith separated interior spaces, said rigidifying means having a truss-like, zig-zag form including angularly shaped segments which are inclined with respect to one another and to said wall elements, and organic polymerizable material occupying said separated interior spaces together with catalyst means enclosed in rupturable casing means, said casing means preventing contact between said polymerizable material and said catalyst means, the environment of said polymerizable material, including such portions of said catalyst means released on a break of a portion of said rupturable casing means by means producing one or more apertures in said wall elements, being pressurized and said polymerizable material and the portions of said catalyst means released from the casing having the property to co-act on contact to produce a sealant forming a pressurized plug of the one or more apertures in said wall elements.

3,969,564

METHOD OF SEAMING CARPETS AND TAPE USED THEREFOR

William E. Carder, Fairport, N.Y., assignor to Carder Industries, Inc., Rochester, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,634

Int. Cl.[2] B32B *3/00*; D04H *11/00*

U.S. Cl. 428—212 6 Claims

1. A method of seaming sections of carpet together with flexible seaming tape, comprising:

impregnating a permeable, flexible seaming tape with a liquid adhesive of the type which is tacky when moist, and non-tacky when dry,

allowing the impregnated tape to dry after it has penetrated into the tape so that the adhesive therein becomes non-tacky,

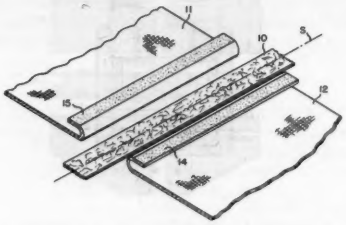
positioning a strip of the dry, impregnated tape on a surface that is to be covered by carpet,

applying to the undersides of two sections of carpet, adjacent the edges thereof that are to form a seam, a liquid adhesive containing a solvent for the first-named adhesive, and

while the adhesive on the undersides of said carpet sections is still moist, urging said undersides of the sections down onto said strip of tape, whereby the solvent in the moist adhesive on said carpet sections penetrates and remoistens the adhesive in said strip of tape, whereby the adhesive on said carpet sections and the remoistened adhesive in said strip of tape combine to form a cohesive bond between the carpet sections and said strip of tape, when the adhesive dries.

4. A method of utilizing both dry and liquid adhesives for adhesively seaming together two fabric sections, comprising:

coating a flexible, permeable tape with a liquid adhesive in such manner that the liquid adhesive penetrates and at least partially saturates said tape,



after the adhesive has penetrated and dried in the tape, placing a strip of the dry tape on a surface that is to be covered by fabric sections,

coating the undersides of two sections of fabric, adjacent the edges thereof that are to be seamed together, with a liquid adhesive similar to the first-named adhesive, and

urging the coated undersides of said fabric sections against said tape while the adhesive on said sections is still moist, whereby the adhesive in said tape is remoistened by the moist adhesive on said fabric sections and mixes therewith to form, upon drying, a cohesive bond between said tape and said sections.

3,969,565

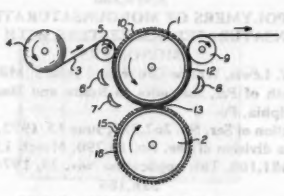
CARD CLOTHING METHOD FOR TREATING THERMOPLASTIC SHEET MATERIAL

Norman Forrest, 216 Byram Road, Byram, Conn. 10573

Filed Mar. 26, 1975, Ser. No. 562,386

Int. Cl.[2] B29D *7/14*

U.S. Cl. 264—284 13 Claims



1. A method of continuously reproducing a non-perforated patterned sheet of thermoplastic material which comprises the following sequential steps:

a. continuously feeding thermoplastic sheet material onto a rotating cylinder covered with card or metallic clothing having a surface of wires;

b. heating said thermoplastic sheet on said rotating cylinder to its heat softening temperature;

c. pressing said thermoplastic sheet against said cylinder by means of a cooperative rotating means covered with card clothing having a surface of wires without perforating said thermoplastic sheet;

d. cooling said pressed thermoplastic sheet on said cylinder to a temperature below its heat softening temperature; and

e. withdrawing said cooled thermoplastic sheet having a non-perforated patterned surface from said cylinder.

3,969,566

ARTICLES OF MANUFACTURING PREPARED FROM POLYMERS OF HYDRAZINE OR DIHYDRAZIDES AND TRICARBOXYLIC ACID ANHYDRIDES

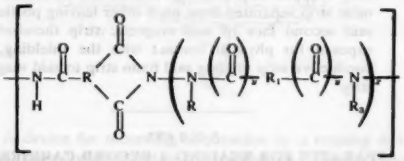
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 369,629, June 13, 1973, Pat. No. 3,882,086. This application Oct. 2, 1974, Ser. No. 511,337

Int. Cl.² C09D *3/70*

U.S. Cl. 428—290 **2 Claims**

1. An article of manufacture comprising: a polymer having the repeating structural formula:



deposited on a substrate selected from the group consisting of fibrous metallic and cellulosic substrates; and wherein R_1 is a divalent organic radical selected from the group consisting of alkylene, arylene and heterocyclic, R_2 and R_3 are monovalent alkyl, aryl, aralkyl, cycloalkyl or hydrogen radicals and x and y are either 1 or 0.

3,969,567

IMPROVEMENTS IN AND RELATING TO BOARD PRODUCTS

John E. Occleshaw, Wigan, and Terence D. Smith, Stockport, both of England, assignors to TAC Construction Materials Ltd., Manchester, England

Filed Mar. 8, 1974, Ser. No. 449,434

Claims priority, application United Kingdom, Mar. 13, 1973, 11953/73

Int. Cl.² C04B *29/02, 7/02;* **B22B** *13/02*

U.S. Cl. 428—297 **15 Claims**

1. An autoclaved fire-resistant board product consisting essentially of, in combination, a hydraulic cement binder, water, a mixture of long and short staple vitreous fibres, from 1 to 10% by weight of a cellulosic fibre, together with chemically reactive silica in an amount sufficient to react with the free lime remaining in the product after reaction between the cement and the water.

3,969,568

ARAMID FLOC REINFORCEMENT OF RUBBER USING PARTICULAR ADHESIVE

Richard Jon Sperley, Detroit, Mich., assignor to Uniroyal Inc., New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,648

Int. Cl.² B32B *5/02, 25/02, 25/12, 25/14*

U.S. Cl. 428—297 **18 Claims**

1. A reinforced rubber composition with increased compression modulus comprising (1) rubber, (2) 1-aza-3,7-dioxabicyclo[3.3.0]octane or derivatives thereof, (3) a material selected from the group consisting of resorcinol, m-aminophenol, m-phenylenediamine, resorcinol monoacetate, resorcinol diacetate, 1,5-naphthalene-diol, and partially reacted resorcinol-formaldehyde resins, and (4) discontinuous discrete fibers of aramid textiles of a length up to about 5 inches.

9. A solid vulcanizable rubber composition containing 1-aza-5-methyl-3,7-dioxabicyclo[3.3.0]octane, resorcinol monoacetate, and discontinuous discrete fibers of grey aramid textiles of a length up to about 5 inches.

10. The use of reinforced rubber composition of claim 1 in a tire.

11. A method of reinforcing rubber having incorporated therein 1-aza-3,7-dioxabicyclo[3.3.0]octane or derivative thereof and a material selected from the group consisting of resorcinol, m-aminophenol, m-phenylenediamine, resorcinol monoacetate, resorcinol diacetate, 1,5-naphthalene-diol, and partially reacted resorcinol-formaldehyde resins, comprising embedding therein prior to vulcanization discontinuous discrete fibers of grey aramid textiles of a length up to about five inches.

3,969,569

COATING COMPOSITION OF A STYRENE/ALLYL ALCOHOL POLYMER AND A POLYISOCYANATE

Joseph A. Vasta, Woodbury, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1974, Ser. No. 519,354

Int. Cl.² C08L *75/08;* **B32B** *15/08*

U.S. Cl. 428—332 **12 Claims**

1. A coating composition comprising 10–90% by weight of film-forming constituents consist essentially of

1. about 10–90% by weight, based on the weight of the film-forming constituents, of a styrene/allyl alcohol polymer of 90–70% by weight styrene and 10–30% by weight allyl alcohol having a hydroxyl content of about 3–9% by weight and a specific viscosity of about 0.4–0.8 measured at 25°C. using 10 grams of copolymer in 100 milliliters of methylethyl ketone; and

2. about 90–10% by weight, based on the weight of the film-forming constituents, of a blocked organic polyisocyanate adduct in which the blocked organic polyisocyanate adduct is the reaction product of a polyether resin or a polyester resin and an aliphatic or cycloaliphatic organic diisocyanate and having the isocyanate groups blocked with an alkyl ketoxime.

3,969,570

COMPOSITION AND METHOD OF BONDING GOLD TO A CERAMIC SUBSTRATE AND A BONDED GOLD ARTICLE

Baynard R. Smith, 701 Lakeside Drive, North Palm Beach, Fla. 33408

Division of Ser. No. 232,943, March 8, 1972, Pat. No. 3,799,890. This application Mar. 22, 1974, Ser. No. 453,569

Int. Cl.² B05D *3/00*

U.S. Cl. 428—336 **32 Claims**

1. A method of bonding a gold layer to a ceramic substrate including the steps of:

a. mixing on a weight basis; (A) about 0.1% to 7.0% of at least one copper oxide powder from the group consisting of cuprous oxide and cupric oxide; (B) 93.0% to 99.9% of gold powder having a particle size approximately of 2–5 microns, said copper oxide powder and said gold powder defining in combination a solid composition mixture, said weight percentages of said copper oxide and said gold powder pertaining to said solid composition mixture; and (C) about 10.0% to 90.0% of an organic binder devoid of glass frits, said organic binder in combination with said copper oxide powder and said gold powder defining a total composition mixture, said weight percentage of said organic binder pertaining to said total composition mixture;

b. applying said total composition mixture to a ceramic substrate to form a coated ceramic substrate; and,

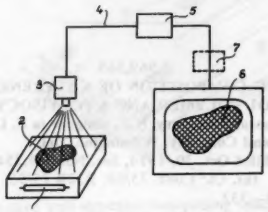
c. firing said coated ceramic substrate at a predetermined temperature within the approximating range of 900°C to 1063°C.

ELECTRICAL

3,969,571
SYSTEM FOR IMPROVING THE EVALUATION OF PICTURES COMPRISING DETAILS HARD TO RECOGNIZE, MAINLY OF FLUOROGRAPHS AND RADIOGRAPHS

Martha Fenyő, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary

Filed Nov. 5, 1974, Ser. No. 521,156
Int. Cl.² H04N *5/14*
U.S. Cl. 178—6 **4 Claims**

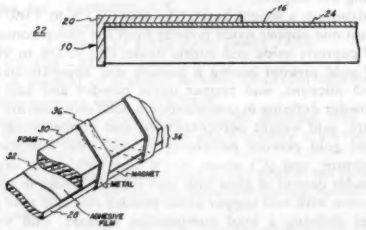


1. In a circuit arrangement for the transmission of picture details through a video chain for the emphasis of blurred contours, the arrangement being connected in series with a section serving for the transmission of video signals separated from synchronous signals of the video chain; the improvement in which the circuit contains delay means having a tapping point, an adder, a frequency-independent level control unit by which the input of the delay means is connected to a first input of the adder, the frequency-independent level control unit being connected between the tapping point and a second input of the adder, the output of the delay means being connected to a third input of the adder, the first and third inputs of the adder belonging to an operation having a common sign, opposite to that of the second input, the circuit input being formed by an input of the delay means, the circuit output being formed by the output of the adder.

3,969,572
ELECTROMAGNETIC INTERFERENCE SHIELDING GASKET FOR LIGHT-WEIGHT EQUIPMENT ENCLOSURES

Paul M. Rostek, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,519
Int. Cl.² H05K *9/00*
U.S. Cl. 174—35 MS **4 Claims**



1. In an equipment enclosure including an opening therein, a separable door covering the opening and an electromagnetic interference shield coextensive with the enclosure, an improved gasket disposed about the opening at a junction of the door with the enclosure bridging discontinuities of the shielding at the junction when the door is in a closed position, said gasket being of the type having a magnetic element attractive to the enclosure, wherein the improved gasket comprises:

A. a laminar strip including

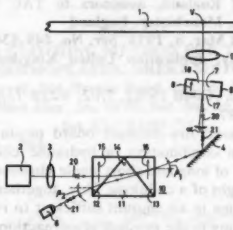
1. a plastic magnetic strip having first and second opposite faces, and
2. a foam strip having first and second opposite faces and a width essentially equal to the width of said magnetic strip, the first face of said magnetic strip coextensively abutting the second face of said foam strip; and

B. a pliable conductive strip wrapped spirally about said laminar strip and forming coils abutting the first face of said foam strip and the second face of said magnetic strip, said foam strip compressed between said magnetic strip and said coils partially with respect to the thickness of said foam strip and uniformly with respect to the length of said foam strip, adjacent ones of the coils of said spirally wrapped strip abutting the second face of said magnetic strip separated from each other leaving portions of said second face of said magnetic strip therebetween exposed for physical contact with the shielding, said conductive strip holding said foam strip to said magnetic strip.

3,969,573
APPARATUS FOR READING A RECORD CARRIER ON WHICH INFORMATION IS STORED IN AN OPTICALLY READABLE STRUCTURE

Gijsbertus Bouwhuis, and Carel Arthur Jan Simons, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,789
Claims priority, application Netherlands, Feb. 15, 1974, 7402170
Int. Cl.² G11B *7/00*; G02F *1/01*
U.S. Cl. 178—6.6 R **1 Claim**



1. An apparatus for reading a record carrier on which information is stored on an optically readable reflecting structure, which apparatus includes a radiation source which supplies a read beam, an objective system for focussing the read beam to a read spot on the information structure of the record carrier, and a radiation-sensitive detector for converting the read beam which is reflected and modulated by the information structure into an electrical signal, the radiation path between the radiation source and the objective system and between said objective system and the detector including a polarization-sensitive beam splitter and a λ/4 plate, wherein the beam splitter is positioned between the detector and the λ/4 plate, for separating the modulated and the unmodulated read beam, characterized in that the λ/4 plate is disposed in a holder in such a way that the normal to the entrance and exit faces for the read beam makes a small angle with said beam, and that the optic axis of the λ/4 plate is perpendicular to the entrance and exit faces so that the operation of the λ/4 plate is independent of its rotational position within the holder.

3,969,574

TUBULAR PLAYER ARM FOR AN OPTICAL RECORDING AND REPRODUCING DEVICE WITH DRIVE COIL AND TACHOGENERATOR COIL ON OTHER END

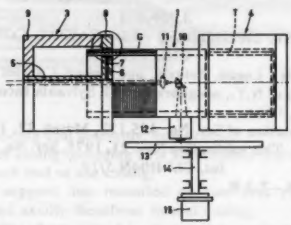
Peter Johannes Michiel Janssen, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,852

Claims priority, application Netherlands, Feb. 28, 1974, 7402768

Int. Cl.[2] H04N 5/76; G11B 21/10, 7/12, 17/00

U.S. Cl. 178—6.6 R 6 Claims



1. A device for recording information on a rotating disk-shaped record carrier and/or for reading the recording from the carrier with a radiation beam, comprising a tubular member, a transducer on the tubular member in the path of the radiation beam, said radiation beam being projected through said tubular member in a direction substantially parallel to the longitudinal axis of said tubular member, means positioned within said tubular member for deflecting the radiation beam out of said tubular member through said transducer, a drive coil surrounding one end of said tubular member, a tacho-generator coil surrounding the other end of said tubular member and providing a tacho-generator signal in response to motion of the tubular member, a separate stationary magnetic system means magnetically coupled to each of said coils for providing a stationary magnetic field and an air gap surrounding each of said coils, a signal source for providing an energizing signal for said drive coil, and means for combining the tacho-generator signal with said energizing signal and for connecting said combined signal to said drive coil.

3,969,575

OPTO-ELECTRONIC FOCUS DETECTION SYSTEM

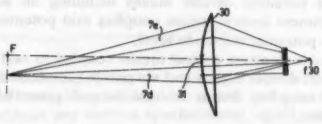
Gerrit Berend Gerritsen, and Gerard Eduard van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,167

Claims priority, application Netherlands, Aug. 8, 1974, 7410642

Int. Cl.[2] G11B 7/12; G01V 1/04

U.S. Cl. 178—6.6 R 6 Claims



1. An opto-electronic focus-detection system for use in an apparatus for writing information in an information surface of a record carrier body as an optically readable radiation-reflecting structure with a writing beam, comprising an objective system for focussing said writing beam on said carrier body, a radiation source which emits a narrow focus detecting beam passing eccentrically through said objective of the write apparatus, two radiation-sensitive detection elements for intercepting the focus detecting beam which is reflected by the record carrier body and which passes the objective for a second time after said reflection, and a lens like element in the path of the reflected focus detecting beam to the radiation-sensitive detection elements, only the outer zone of said lens like element having a lens action, and the central part of said lens like element passing said focus detecting beam without affecting the direction of the focus detecting beam.

3,969,576

APPARATUS FOR READING A RECORD CARRIER WITH AN OPTICAL INFORMATION STRUCTURE

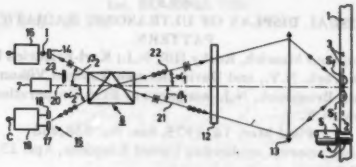
Lieuwe Boonstra, and Antonius Adrianus Marius van Alem, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,111

Claims priority, application Netherlands, Nov. 13, 1974, 7414776

Int. Cl.[2] H04N 5/76; G11B 7/12, 17/00

U.S. Cl. 178—6.6 R 3 Claims



1. An apparatus for reading a record carrier which is provided with information, for example video and/or audio information, in an optically readable structure, which apparatus comprises a radiation source, an objective system for focussing the radiation supplied by the radiation source onto a plane of the information structure, optical means for deriving a read beam and a focus detection beam angularly diverging from said read beam from the radiation supplied by the radiation source, the apex of the angle of divergence of said focus detection beam and said read beam being located between the optical means and the objective system forming an imaginary radiation source, a radiation-sensitive signal detection system for converting the read beam which is modulated by the information structure into an electrical signal, and a radiation-sensitive focus detection system for converting the focus detection beam into an electrical signal, the optical means comprising a Wollaston prism disposed between the radiation source and the objective system, and a radiation absorbing element in the path of said focus detection beam between the imaginary radiation source for the focus detection beam for blocking a part of said focus detection beam and introducing spatial assymetry into said focus detection beam.

3,969,577

SYSTEM FOR EVALUATING SIMILAR OBJECTS

Raymond A. Lloyd, Laurel; Kenneth C. Ryan, Finksburg, both of Md., and William L. Hrybyk, deceased, late of Linthicum, Md. (by Catherine R. Hrybyk, executrix), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,880

Int. Cl.[2] H06N 7/18

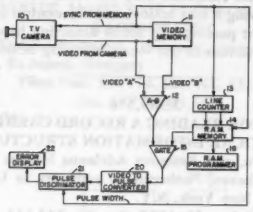
U.S. Cl. 178—6.8 5 Claims

1. A system for evaluating similar objects, comprising in combination:

a. means for generating a first multiline signal having a predetermined relationship to the image of the model;

b. means for generating a second multiline signal having a predetermined relationship to the image of the object to be evaluated;

c. a counter which contains a number which specifies which line of said first and second multiline signals is available for evaluation;



d. programmable means responsive to the number stored in said counter for selecting lines from said first and second multiline signals for evaluation to determine if said object to be evaluated meets predetermined specifications.

3,969,578

VISUAL DISPLAY OF ULTRASONIC RADIATION PATTERN

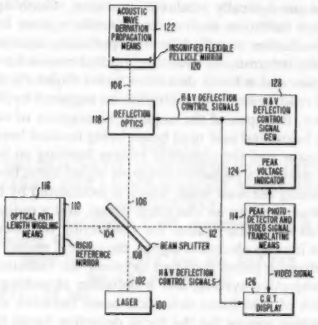
Reuben Saul Mezrich, Rocky Hill, N.J.; Karl-Friedrich Etzold, New York, N.Y., and David Herman Raphael Vilkomerson, South Brunswick, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,468

Claims priority, application United Kingdom, Apr. 23, 1974, 17708/74

Int. Cl.² H04N *7/18*

U.S. Cl. 178—6.8 **15 Claims**



1. In a system responsive to the intensity of radiated ultrasonic wave energy having a first given frequency; the combination comprising:

a. first means including a detection means responsive to the illumination thereof with interfering first and second components of coherent light of predetermined wavelength λ for deriving an output signal substantially proportional to the peak phase change at said first given frequency in said first and second light components;

b. second means including an interferometer for illuminating said detection means with said first and second interfering light components, wherein said interferometer comprises a substantially rigid reference mirror illuminated by said first light component and a flexible pellicle mirror of given surface area having a selected spot thereof illuminated by said second light component; said selected spot on said flexible pellicle mirror, in response to being insonified by said ultrasonic wave energy, vibrating at said first given frequency through an acoustic displacement amplitude Δ determined by the intensity of said ultrasonic wave energy insonifying said selected spot, wherein $\Delta << \lambda$, and

c. third means for wiggling at a second given frequency the round-trip optical path length of said first light component reflected from said rigid reference mirror by an amount which is greater than λ/2, said second given frequency being significantly lower than said first given frequency,

d. whereby said output signal derived by said detection means is substantially proportional to the acoustic displacement amplitude Δ of said selected spot.

3,969,579

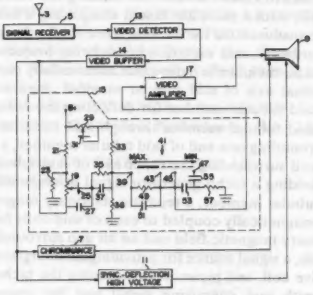
CONTRAST, BRIGHTNESS AND PEAKING CONTROL CIRCUIT

Robert Patrick Logan, Batavia, and Robert Charles Wheeler, Elba, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 455,122, March 27, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,197

Int. Cl.² H04N *5/14*

U.S. Cl. 178—7.3 R **3 Claims**



1. In a television receiver having a video signal channel, a secondary control circuit comprising:

a potential source;

first voltage divider means coupling said potential source to a potential reference level;

second potential divider means including an adjustable brightness control means coupling said potential source to a potential reference level;

adjustable contrast control means coupled to said first potential divider means and via parallel connected AC and DC coupling means to said second potential divider means;

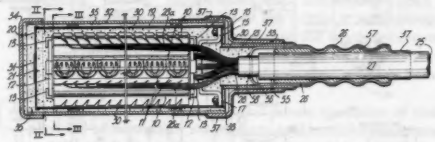
adjustable peaking control means directly connected to said second potential divider means and said parallel connected AC and DC coupling means and to a potential reference level; and

a pair of connectors coupling said secondary control circuit to said video signal channel including a first connector coupling said video signal channel to said adjustable contrast control means and a second connector coupling said adjustable peaking means to said video signal channel.

3,969,580
LOADING COIL ASSEMBLIES FOR COMMUNICATIONS CABLES

George Debortoli; Peter McGivery Chase, both of Ottawa, and Helmut H. Lukas, Carleton Place, all of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 22, 1975, Ser. No. 615,773
Int. Cl.² H01F 17/08
U.S. Cl. 178—46 15 Claims

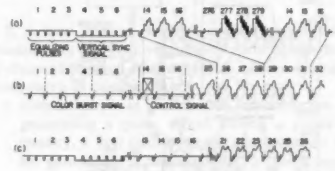


1. A loading coil assembly, comprising:
an inner casing including first and second end discs, a disc at each end of the casing;
a first support disc mounted on said first end disc and spaced axially therefrom in said casing;
a plurality of assembled loading coil magazines in said casing, said magazines extending axially and spaced circumferentially around the axis of said casing, mounting means at each end of each magazine, the mounting means at one end of each magazine engaging with the periphery of said first support disc;
a second support disc adjacent to said second end disc, said mounting means at the other end of each magazine engaging with the periphery of said second support disc;
cable entry and attachment means, attached to said first end disc;
a further casing enclosing said inner casing and spaced therefrom; and
expanded synthetic resin electrically insulative material filling spaces in said inner casing and between said inner casing and said further casing.

3,969,581
VERTICAL SYNCHRONIZING SIGNAL RECORDING APPARATUS

Yoshizumi Watatani, Machida, and Michio Masuda, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 19, 1975, Ser. No. 578,765
Claims priority, application Japan, May 22, 1974, 49-57640
Int. Cl.² H04N 7/00; H04L 7/00; H04N 5/78
U.S. Cl. 178—5.6 3 Claims

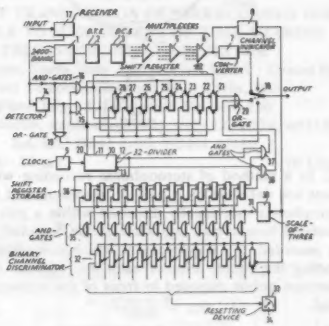


1. In a recording apparatus receiving a time-division multiple signal comprising a first video signal, and a second video signal without any vertical synchronizing signal, said second video signal being divided for each horizontal scanning line and, in the predetermined number of the horizontal scanning lines, inserted in predetermined positions within the vertical fly-back period of said first video signal, said second video signal being extracted and recorded for the purpose of reproduction; the improvement comprising means for extracting from said multiple signal said second video signal inserted in said predetermined positions within the vertical fly-back period of said first video signal, means for recording said second video signal extracted by said extracting means, means for detecting the vertical synchronizing signal for said first video signal transmitted at substantially the position where a vertical synchronizing signal for said second video signal should be located, means for extracting said vertical synchronizing signal for said first video signal from said multiple signal when said position where said vertical synchronizing signal for said second video signal should be located is detected by said detecting means, and means for recording on the recording means for said second video signal the vertical synchronizing signal extracted by said extracting means.

3,969,582
SYSTEM FOR AUTOMATIC SYNCHRONIZATION OF BLOCKS TRANSMITTING A SERIES OF BITS

Hendrik Cornelis Anthony van Duuren, Wassenaar, and Herman da Silva, Voorburg, both of Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, Netherlands

Filed Dec. 20, 1974, Ser. No. 535,040
Claims priority, application Netherlands, Dec. 21, 1973, 7317591
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R 12 Claims



1. In a system for transmitting and receiving a continuous series of binary information bits of an indefinite length between two stations, wherein said series is divided into balanced blocks of a predetermined number of bits, the improvement comprising automatically maintaining synchronism of said blocks of signals communicated between said stations, comprising:
A. detecting an out-of-balance in the bits in said blocks received at one station,
B. generating and transmitting one special balanced framing block of bits at said one station in response to said out-of-balance detection, said special framing block having bits in specific locations therein for its identification and synchronization,
C. receiving and detecting at the other station said one special framing block signal,
D. generating and transmitting at said other station another special framing block of bits in response to the detection of said one special framing block,
E. receiving and detecting said other special framing block at said one station indicating the reestablishment of synchronism,
F. switching from transmission of one special framing block to information blocks at said one station on receipt of said other framing block, and
G. switching from transmission of said other framing blocks to information blocks at said other station when said information blocks from said one station are received at said other station.

3,969,583

METHOD OF STEREOPHONIC RECORDING

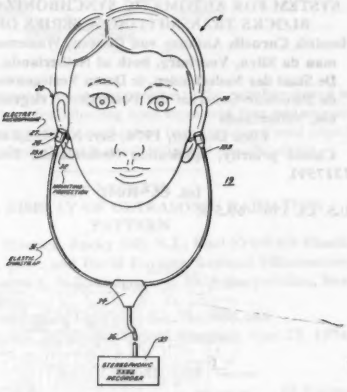
Hans-Joachim Griese, Isernhagen; Paul-Friedrich Warning, and Klaus-Hinrich Wichmann, both of Mellendorf, all of Germany, assignors to Sennheiser Electronic, Bissendorf, Hannover, Germany

Filed Apr. 16, 1974, Ser. No. 461,366

Claims priority, application Germany, Mar. 2, 1974, 2410146

Int. Cl.² H04R 5/00

U.S. Cl. 179—1 G **6 Claims**



1. In a method of stereophonic recording wherein sound waves are detected by a pair of head-mounted stereophonic microphones individually disposed within a pair of actual or simulated human ears and wherein the detected sound waves are recorded, the improvement which comprises the step of locating the sound inlet of each microphone at prescribed reference points disposed in front of the entrance to the ear canal.

3,969,584

SYSTEM FOR RECORDING THE ACTUATION OF REMOTELY LOCATED LOCKING DEVICES

Cecil John Miller, 18134-8 Killion St., Tarzana, Calif. 91356, and Richard W. Foster, 1845 Niodrara Drive, Glendale, Calif. 91205

Filed Jan. 17, 1975, Ser. No. 541,707

Int. Cl.² H04M 11/00; H04G 3/00

U.S. Cl. 179—2 A **14 Claims**

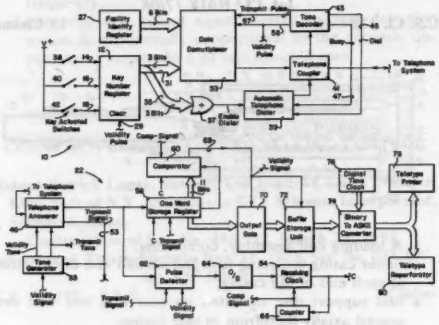
6. A system for providing a record at a central office of the actuation of at least one locking device disposed at least at one remote location, said system comprising:

lock monitoring means, located at the remote location for providing a key identifying signal upon each actuation of the associated locking device, said key identifying signal being indicative of the actuating key;

first means located at the remote location and responsive to the key identifying signal, for automatically transmitting the central office a facility identifying signal indicative of the facility at which the actuated locking device is located and for automatically transmitting the key identifying signal to the central office;

second means located at the central office for receiving said key and facility identifying signals and for providing a record of said signals and the time and date of their receipt; and wherein

said first means includes telephone dialing means responsive to said key identifying signal for automatically dialing the telephone number of the central office; and data transmission means for repetitively transmitting said key and facility identifying signals to the central office by means of the telephone system, said transmission commencing upon receipt of an authorizing signal from said second means and terminating upon receipt of a validity signal from said second means; and wherein said second



means includes means for producing said authorization signal upon the completion of the telephone connection between said first and second means; and means for producing said validity signal after successive identical sets of said repetitively transmitted data which resulted from a given key actuation have been received.

3,969,585

FREQUENCY-DIVISION MULTIPLEXER FOR TELEPHONE TRANSMISSION PROVIDING FOR TRANSPOSITION OF CONVERSATION AND CALLING CHANNELS INTO A PRIMARY FREQUENCY GROUP

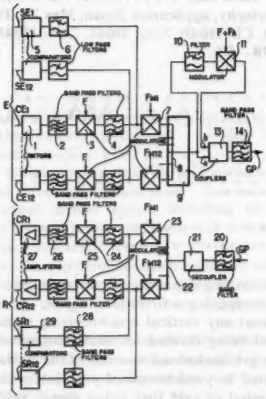
Claude Boulanger, Chevilly-Larue, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Aug. 16, 1974, Ser. No. 498,116

Claims priority, application France, Aug. 16, 1973, 73.29880; June 12, 1974, 74.20360

Int. Cl.² H04J 1/06

U.S. Cl. 179—15 FD **6 Claims**



6. In a multi-channel transmission system for converting to a primary band group: voice signals in a voice band from a plurality of voice channels, and auxiliary signals, such as calling and supervisory signals, having a very low frequency from

a plurality of auxiliary channels pertaining to the respective voice signals, a multiplexer comprising:

premodulation means for converting respective voice signals of respective voice channels into a plurality of premodulated voice channels having a same carrier frequency,

means for coupling respective auxiliary channels with respective ones of said premodulated voice channels,

modulation means for modulating the respective coupled channels into a plurality of modulator stages having respective carrier frequencies for converting each premodulated voice channel to the primary band group,

extra modulation means for modulating the whole spectrum of said plurality of modulator stages such that modulated auxiliary channels are positioned into said primary band group, and

band filtering means receiving said whole spectrum of said plurality of modulator stages from said modulation means and the modulated whole spectrum from said extra modulation means for supplying said voice signals and said auxiliary signals in said primary band group.

3,969,586

MULTIPLEX SIGNAL TRANSMISSION DEVICE

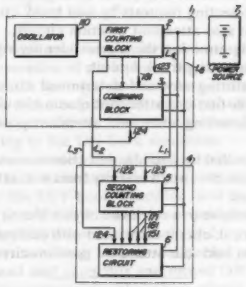
Hisato Wakamatsu, Kariya, Japan, assignor to Nippondenso Co., Ltd., Japan

Continuation of Ser. No. 246,482, April 21, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 465,359

Claims priority, application Japan, Apr. 22, 1971, 46-26376

Int. Cl.[2] H04J *3/04*

U.S. Cl. 179—15 A **9 Claims**



5. A time division multiplex signal transmission system for transmitting and receiving information signals from a plurality of channels in each of a succession of time frames, said system comprising in combination,

a transmitter, said transmitter including an oscillator for generating a pulse signal having a predetermined frequency; a first circuit means connected to said oscillator for generating a timing signal, a synchronous signal for synchronizing each frame of the transmitted signal, and an address signal for defining each of a plurality of time intervals within each of said frames, said first circuit means further including means for generating strobe pulses, one for each time interval within said frame, said strobe pulses having a duration which is less than the duration of said time intervals, and a combiner circuit connected to said first circuit means and to each of a plurality of channels containing information signals to be transmitted, said combiner circuit including means responsive to said address, information and strobe signals for generating a time division multiplex level signal having a duration in each of said time intervals equal to the time duration of said strobe pulses wherein said timing, synchronous and level signals are transmitted separately, and

a receiver, said receiver including a second circuit means responsive to said transmitted timing and synchronous signals for generating a second address signal for defining each of said plurality of time intervals within said frame of said transmitted level signal, said second circuit means including a means for generating a transverse signal during the last time interval of each of said frames, a restoring circuit connected to said second circuit means, said restoring circuit including means responsive to second address signal and said level signal for converting said level signal back to said plurality of information signals, and

means for storing each of said information signals, said means for storing said information signals comprising a first memory circuit for storing the converted information signal, said first memory circuit being reset in response to said transmitted synchronous signal, and a second memory circuit connected to said first memory circuit restoring the output information signal of said first memory circuit, wherein said output information signal is transferred from the first to the second memory circuit in response to the receipt of said generated transverse signal.

3,969,587

SELECTIVE TRANSMISSION OF PRERECORDED VOICE SIGNALS TO SUBSCRIBERS OF TIME-SHARING TELECOMMUNICATION SYSTEM

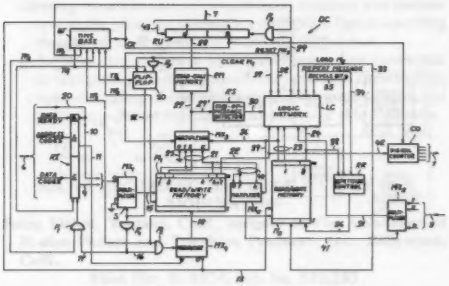
Piero Calcagno, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed July 14, 1975, Ser. No. 595,430

Claims priority, application Italy, July 12, 1974, 69218/74

Int. Cl.[2] H04J *6/00;* **H04M** *15/10*

U.S. Cl. 179—15 AT **10 Claims**



1. In a time-division-multiplex telecommunication system with *m* temporal voice channels extending between respective subscriber stations and a central office, timing means at said central office for sequentially scanning said channels in a recurrent cycle of *m* time slots, and a processor at said central office responsive to selection signals from any subscriber station for emitting relevant call information, the combination therewith of:

a dynamic memory provided with *n* endless signal tracks containing respective prerecorded audibly reproducible message words representing different types of call information available from said processor, each message word being prefaced on its track by a synchronizing signal, said dynamic memory having *n* first outputs emitting the message words and *n* second outputs emitting the synchronizing signals of respective tracks;

first storage means provide with *m* principal memory stages respectively allocated to said *m* channels;

asynchronously operative circuitry for loading a first memory stage, allocated to a channel serving an inquiring subscriber, with at least one data code received from said

processor and identifying a signal track carrying relevant call information;

synchronously operative circuitry controlled by said timing means and selectively connectable to any of said second outputs in response to a registered data code for initiating, upon the occurrence of a corresponding synchronizing signal, a periodic readout in recurrent time slots, assigned to the channel serving the inquiring subscriber, of a data code loaded into a principal memory stage allocated to the same channel;

switch means responsive to said timing means for periodically connecting any one of said channels, during an assigned time slot, through a respective first output of said dynamic memory to a selected signal track thereof identified by a data code read out from a principal memory stage allocated to the respective channel, thereby transmitting the prerecorded message word of the selected signal track to the inquiring subscriber; and

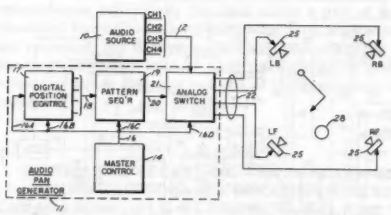
second storage means in said synchronously operative circuitry provided with *m* ancillary memory stages for respectively monitoring the activities of said *m* principal memory stages and terminating the readout of a data code therefrom after a period sufficient to transmit the entire prerecorded message word of the selected signal track.

3,969,588

AUDIO PAN GENERATOR

Stephen M. Raydon, Boulder, and Ronald E. Hays, Northglenn, both of Colo., assignors to Video and Audio Artistry Corporation, Boulder, Colo.

Filed Nov. 29, 1974, Ser. No. 528,220
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 G **28 Claims**



7. Apparatus for introducing audio signals from at least one source to a plurality of audio output transducers for creating sound patterns and effects comprising:

a source of clock pulses,

means responsiive to said clock pulses for generating cycles of pairs of increasing and decreasing signal levels,

a plurality of voltage controlled amplifiers having the outputs thereof connected to respective transducers and each having one of the inputs thereof connected for receiving the audio signals from at least one audio signal source,

means for switching the pairs of signal levels from said generating means to said plurality of amplifiers, and

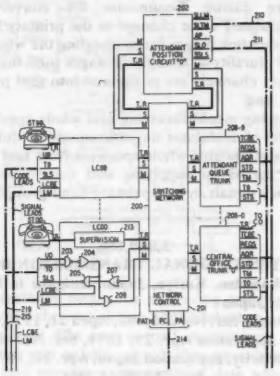
input means for providing control signals to said switching means for selectably establishing connection of the signal level pairs from said generating means to provide the respective other inputs to at least two of said amplifiers, whereby the sound from the source will appear to move relative to the audio transducers selected by the said input means control signals at a rate determined by the said generating means signal levels.

3,969,589

TELEPHONE SWITCHING SYSTEM HAVING ATTENDANT QUEUING FACILITIES

Henry August Meise, Jr., Boulder, and George William Taylor, Broomfield, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 22, 1975, Ser. No. 606,837
Int. Cl.² H04Q *3/64*
U.S. Cl. 179—27 D **16 Claims**



1. In a telephone switching system, a first-in first-out attendant queue circuit, an attendant position circuit, a plurality of trunk circuits, an attendant queue arrangement comprising:

means for detecting requests by said trunk circuits for connection to said attendant position circuit;

means for determining the circuit identity of any said detected requesting trunk circuit;

means for storing any said determined circuit identity in said first-in first-out attendant queue circuit;

means for detecting when said attendant position circuit is idle;

means controlled by said idle detection means for retrieving a next available circuit identity from said attendant queue circuit; and

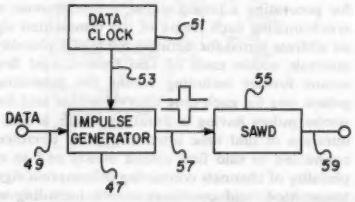
means responsive to a retrieved circuit identity for connecting said trunk circuit associated with said retrieved circuit identity to said idle attendant position circuit.

3,969,590

SURFACE ACOUSTIC WAVE APPARATUS

Anant K. Jain, Richardson, and Robert K. Marston, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 4, 1975, Ser. No. 565,035
Int. Cl.² H04L *27/12*
U.S. Cl. 178—66 R **5 Claims**



1. Minimum shift keyed modulating apparatus comprising, in combination:

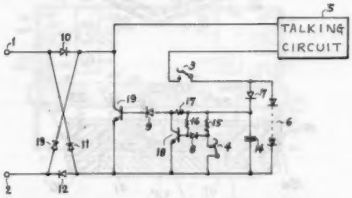
piezoelectric substrate means;
input impulse signal supplying means for supplying unmodulated input impulses having a period T therebetween;
input transducer means mounted on said substrate means and connected to said input signal supplying means;
output transducer means, for providing an output constant frequency carrier signal having an amplitude weighted envelope in an oscillatory period having a duration greater than T for each inpulse applied to said input transducer means, mounted on said substrate means; and
output signal means electrically connected to said output transducer means for providing MSK output signals.

3,969,591

CIRCUIT FOR PREVENTING IMPULSE GENERATION BY OPERATING A HOOK SWITCH IN A TELEPHONE SET

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Dec. 18, 1974, Ser. No. 533,801
Claims priority, application Japan, Dec. 28, 1973, 48-1490
Int. Cl.² H04M *1/74*
U.S. Cl. 179—84 R **3 Claims**



1. In a telephone set, a circuit for preventing impulse generation by the operation of a telephone hook switch, comprising:
the hook switch having a make contact and a break contact which are make-before-break contacts when going to the OFF-hook condition, and break-after-make contacts when going to the ON-hook condition;
a capacitor connected to said make contact to be charged through said make contact when said make contact is closed in the OFF-hook condition, and to be discharged through said break contact when said break contact is closed in the ON-hook condition; and
a transistor switching circuit connected to said break contact and said capacitor and turned ON by the charge on the capacitor to develop short-circuit between telephone line terminals of the telephone set when the break contact is closed.

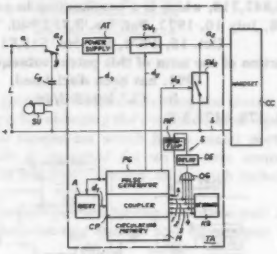
3,969,592

PUSHBUTTON-CONTROLLED CALL-NUMBER SELECTOR FOR DIAL-EQUIPPED TELEPHONE

Roberto Pipitone, and Vittorio Montesi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 2, 1974, Ser. No. 429,909
Claims priority, application Italy, Jan. 3, 1973, 19009/73
Int. Cl.² H04M *1/44*
U.S. Cl. 179—90 K **10 Claims**

1. A call-number selector for a subscriber station of a telecommunication system linked with an exchange through a two-conductor transmission line, comprising:
a normally open hook switch in a conductor of said line closable upon the initiation of an outgoing call to complete a signal loop to the exchange;
an energy-storing circuit in said signal loop including a capacitor connected in series with said conductor for charging from a d-c source in the exchange upon closure of said hook switch;
a set of manually operable switches for the selection of respective call-number digits;
coding means provided with a plurality of output leads selectively connectable across said capacitor for energization by the charge thereof upon the operation of any of said switches;
memory means connected to said output leads for storing a code combination of a selected digit, said memory means being normally nonreceptive to said code combination;
pulse-generating means energizable by the charge on said capacitor and responsive to the contents of said memory means for emitting a series of dial pulses corresponding to the value of the selected digit;



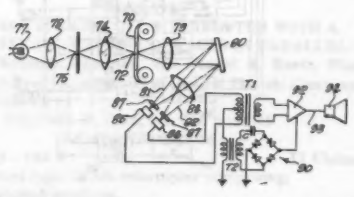
timing means energizable by the charge on said capacitor and connected to said output leads in parallel with said memory means for transmitting to said memory means an enabling pulse in response to energization of any of said output leads, thereby making said memory means responsive to said code combination;
clearing means connected across said capacitor and responsive to the charging thereof for emitting a signal canceling the stored code from said memory means; and
pulse-repeating means in said transmission line connected to said pulse-generating means for actuation thereby with open-circuiting of said signal loop in response to each dial pulse for a period insufficient to discharge said capacitor.

3,969,593

SOUND RECORDING ON COLOR FILM BY HUE MODULATION

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers Inc., Hollywood, Calif.

Filed Nov. 8, 1974, Ser. No. 522,233
Int. Cl.² G11B *7/00, 7/24, 23/18*
U.S. Cl. 179—100.3 B **34 Claims**



1. Optical sound record comprising
a film strip carrying at an elongated sound track area at least two light selective media which produce respective optical densities predominantly limited to distinct regions of the photographic spectrum,
each of said densities being essentially uniform transversely of the track area, and

said densities of the respective two media being modulated longitudinally of the track area in mutually inverse phase relation in accordance with a common sound signal,

the corresponding inverse density variations of said two media being mutually superposed.

3,969,594

AUTOMATED TELEPHONY TESTING AND POLLING APPARATUS AND SYSTEM

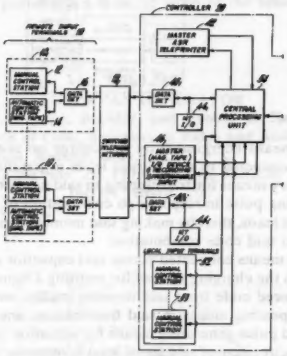
Paul V. DeLuca, Port Washington; John J. Gazzo, Jr., Commack; Vincent F. Santulli, Manhasset; Errol Siegel, New York, and Vito Mannino, Holbrook, all of N.Y., assignors to Porta Systems Corporation, Syosset, N.Y.

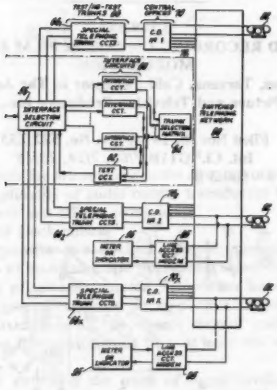
Continuation-in-part of Ser. No. 313,817, Dec. 11, 1972, Pat. No. 3,842,218, which is a continuation-in-part of Ser. No. 270,058, July 10, 1972, Pat. No. 3,752,940. This application Oct. 15, 1974, Ser. No. 515,011

The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **10 Claims**





1. In combination in telephone subscriber line energizing apparatus, a stored program controlled central processor, input/output means for supplying to said central processor subscriber information and for storing subscriber information supplied thereto from said central processor, control processing circuitry including stored program controlled microprocessor means for bilaterally communicating with said central processor, a matrix of trunks adapted to not cause ringing when a subscriber line is seized thereover, means responsive to said microprocessor means to select one of said trunks, and line energizing means responsive to said microprocessor means for energizing a subscriber line and for communicating the results of such energization to said microprocessor means for translation to said central processor.

3,969,595

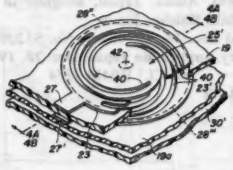
SEQUENTIAL SWITCHING ASSEMBLY HAVING PLURAL, SPACED FLEXIBLE CONTACT LAYERS

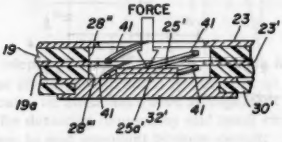
Wendell C. Johnson, Topanga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 23, 1974, Ser. No. 508,477

Int. Cl.² H01H *13/70, 1/06*

U.S. Cl. 200—5 A **6 Claims**





1. A switching device comprising:

a first metallic contact member having a first focibly movable contact area portion defined therein by a plurality of curved slots and a support portion surrounding said first forcibly movable contact area portion,

a second metallic contact member having a second forcibly movable contact area portion defined therein by a plurality of curved slots and a support portion surrounding said second forcibly movable contact area portion,

a third metallic contact member,

first means for combining said metallic contact members into a unitary structure with said first and second metallic contact members adjacent each other and electrically isolated from each other, with said second and third metallic contact members adjacent each other and electrically isolated from each other, and with said first and second movable contact area portions in axial alignment with at least a portion of said third contact member, said first means permitting movement of said first and second contact area portions along said alignment axis,

second means for maintaining adjacent contact members at different potentials, and

switch actuating means in operative association with said contact members, said switch actuating means being capable of achieving (1) movement when a force is applied thereto of only said first contact area portion of said first metallic member without movement of said support portion surrounding said first forcible movable contact area portion and without changing the shape of said first contact area portion to achieve one switching function or (2) movement of both said first contact area portion of said first metallic member without movement of said support portion surrounding said first forcibly movable contact area portion and without changing the shape of said first contact area portion and said second contact

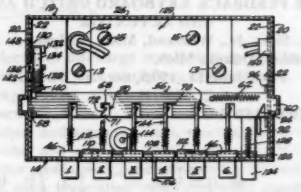
area portion of said second metallic contact member without movement of said support portion surrounding said second forcibly movable contact area portion and without changing the shape of said second contact area portion to achieve two switching functions, with said first contact area portion being capable of movement independent of movement of said second contact area portion and with said second contact area portion being capable of movement only in conjunction with movement of said first contact area portion.

3,969,596

COMBINATION LOCK FOR THE IGNITION HOOD AND TRUNK OF AN AUTOMOTIVE VEHICLE

Frederick Siegel, 2228 Monroe, Hollywood, Fla. 33020

Filed Feb. 26, 1975, Ser. No. 553,175
Int. Cl.² H01H 27/10
U.S. Cl. 200—43 **12 Claims**



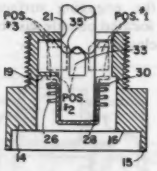
1. A combination lock for an automotive vehicle ignition, hood and trunk lid comprising an ignition switch and hood and trunk lid switches, a main housing including a removable portion for access to an interior chamber, defined by said housing; a longitudinally extending control shaft, rotatably journaled in said chamber between opposed end walls of said housing; a plurality of lug means, fixed relative to said control shaft, providing abutment surfaces, spaced circumferentially outwardly of the outer surface of said control shaft in a predetermined, equally spaced apart relationship; a plurality of outwardly accessible push buttons, exceeding in number the number of said lug means; a plurality of inwardly extending arms connected to respective push buttons, corresponding in number to the number of lug means, and in respective alignment therewith, each of said arms including an inner abutment surface positioned to contact one of said lug abutment surfaces to rotate said control shaft through a predetermined number of degrees when the arm carrying push buttons are depressed in a proper sequential order; a lock bar, longitudinally slidable in said interior chamber in a parallel relationship with said control shaft and including tension spring means to normally maintain said lock bar in a first position; lock means associated with said lock bar and arms to first, move said lock bar to a second position as each arm carrying push button is sequentially actuated in proper order, and, second, to permit the lock bar to return to said first position to sequentially lock said arms and push buttons in their depressed positions; a first electric switch, located adjacent to one end of said control shaft; positioned to trip said first switch when all of said arm carrying push buttons have been depressed in a proper sequential order, to initially condition electric circuits to said ignition switch and to a pair of switches in respective circuits to hood and trunk lid solenoid actuated latches.

3,969,597

KEY OPERATED ELECTRIC GROUND SWITCH

Thomas F. Osika, Gary, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Jan. 2, 1975, Ser. No. 537,901
Int. Cl.² H01H 9/28
U.S. Cl. 200—44 **9 Claims**



1. An electric ground circuit switch using the insertion of a key into the switch for changing the condition of an operating electric circuit in equipment which has a metal portion in which said switch is mounted for an electric connection through the switch and metal portion, said switch including in combination

a hollow conduction portion having a closure wall at one end with a key-opening therein and being open at the other end,

a hollow nonconductive portion which is open at one end and substantially closed at the other end,

terminal means on said hollow nonconductive portion,

means for electrically connecting said terminal means and said hollow conductive portion including a conductive compressible coiled spring positioned in said hollow nonconductive portion in conductive contact with said terminal means and also including a cup-shaped metal member positioned within said coiled spring and biased by said coiled spring into conductive contact with said hollow conductive portion at the key-opening end of the latter,

a key insertable through said key opening end for positioning in said cup-shaped metal member, said key being rotatable from a first position to a second position and acting when so rotated to move said cup-shaped metal member out of conductive contact with said hollow conductive portion against the bias of said coiled spring to change the condition fo a grounding electric circuit through said terminal means and said coiled spring and said cup-shaped metal member to said hollow conductive portion,

and means for maintaining said key in the rotated position with said cup-shaped member in the moved position, which latter position is out of electrical contact with said hollow conductive portion of said switch.

3,969,598

VACUUM-TYPE CIRCUIT INTERRUPTER WITH A PLURALITY OF SETS OF CONTACTS IN PARALLEL

Joseph C. Sofianek, Broomall, and Donald R. Kurtz, West Chester, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Feb. 3, 1975, Ser. No. 546,475
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B **17 Claims**

1. A vacuum-type circuit interrupter comprising:

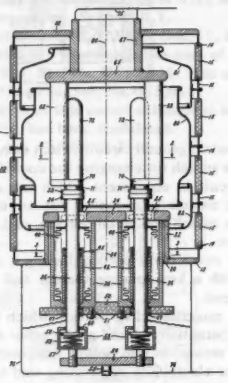
a. an evacuated envelope,

b. a plurality of pairs of separable contacts located within said envelope, each pair including a movable contact having a surface that engages a surface of the other contact when the interrupter is fully closed,

c. a plurality of elongated conductive contact rods on which said movable contacts are respectively mounted, each movable contact being electrically connected to its associated contact rod, said contact rods being located in

side-by-side physical relationship and being electrically connected in parallel with each other, said contact rods extending between the interior and exterior of said evacuated envelope and being axially movable to effect separation of the contacts of the associated pair of contacts,

d. a plurality of elongated tubes of highly conductive metal respectively surrounding said contact rods, each tube being radially spaced from its associated surrounded contact rod, the engaging surfaces of said pairs of contacts being located outside said tubes when said interrupter is fully closed,



e. means for mounting said tubes in fixed relationship with respect to said envelope and in adjacent side-by-side relationship with respect to each other so that said tubes define flux-controlling shields around said contact rods in which eddy currents are developed to substantially reduce the magnetic flux penetrating into the interior of each tube from any adjacent contact rod,

f. means for producing substantially simultaneous contact-separating motion of said contact rods,

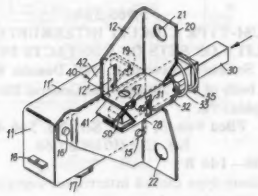
g. and means providing a seal about each of said contact rods that permits axial movement thereof without impairing the vacuum within said envelope.

3,969,599

OFFSET PADDLE ACTUATOR FOR PUSH-ROD SWITCH

Ronald Terry, Princeton, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,053
Int. Cl.² H01H *3/20*
U.S. Cl. 200—153 T **9 Claims**



7. A push rod mechanism for use in actuating a switch comprising

a push rod,

a flat mounting bracket,

a U-shaped channel member disposed with its open side on one face of said bracket thereby defining a slideway for receiving said push rod and for permitting axial movement of the rod between first and second positions,

an actuating lever having first and second oppositely extending paddles spaced by a narrow intermediate portion,

a slot in said mounting bracket located to intersect the open face of said channel member,

said actuating lever being disposed transversely of the mounting plate with its first paddle on one side thereof in said slideway and with its second paddle on the opposite side of the mounting plate.

the intermediate portion of the actuating lever being pivotally retained in said slot by said channel means,

the first paddle being pivoted by the push rod when the rod moves to its second position, whereby the second paddle also is pivoted in response to movement of the push rod,

a switch having actuator means mounted on the opposite face of said mounting bracket,

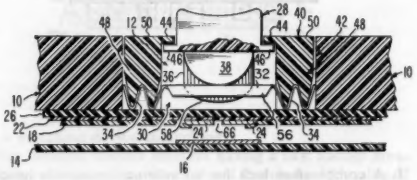
said switch actuator means being spring biased and located to pivot the second paddle when the push rod is in its first position, said second paddle operating to depress said switch actuator means when the push rod is in its second position.

3,969,600

TACTILE FEEDBACK KEYBOARD SWITCH ASSEMBLY AND ACTUATOR

Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 11, 1975, Ser. No. 586,039
Int. Cl.² H01H *13/14, 3/17*
U.S. Cl. 200—159 B **22 Claims**



13. A switch assembly including, in combination:

a. relatively rigid means including a first of a pair of electrical contacts carried on a surface portion thereof;

b. flexible diaphragm means spaced from said rigid means and including a second of said pair of electrical contacts carried on a surface portion thereof, said diaphragm means being deflectable in the direction or the rigid means to effect closure of the pair of electrical contacts;

c. means mounted for movement along a path toward and away from the pair of contacts and disposed on the side of the flexible diaphragm means opposite to the rigid means, said movable means including a pair of depending members for applying pressure to the flexible diaphragm means and to thereby effectuate the closure of the pair of electrical contacts; and

d. means for yieldably resisting movement of the movable means toward the rigid means, said yieldably resisting means including spring means disposed above the flexible diaphragm means and intermediate the pair of depending members, said spring means being comprised of leg means and interconnecting beam means that provides a first yieldable resistance to the movement of the movable means and that is qualified for buckling in response to a first predetermined pressure applied by said movable means, said beam means providing a second lesser yieldable resistance to the movement of said movable means following said buckling such that a lesser second predetermined pressure applied by said movable means will serve to continue the deflection of said diaphragm means in the closure of the pair of electrical contacts.

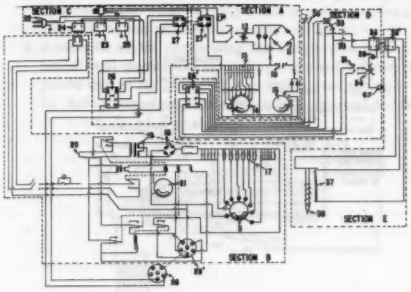
3,969,601
ELECTRONIC SPARK TREATING AND ERODING METALS

Isadore J. Rocklin, 3240 Douglas St., Sioux City, Iowa 51104

Continuation-in-part of Ser. No. 130,734, April 2, 1971, abandoned. This application Aug. 6, 1973, Ser. No. 386,189

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 G **14 Claims**



1. An electrical discharge machining apparatus for spark discharge treatment of a workpiece comprising:

a. a workpiece;

b. an electrode;

c. individual and separate units, electrically isolated from each other and including a main power supply unit, a first capacitor power pack generating unit, a second capacitor power pack generating unit, a control panel unit, an electrode positioning unit, and electrical cable connection means to selectively interconnect said units;

d. said first capacitor power pack generating unit comprising capacitor discharge power supply means connected between said electrode and said workpiece to provide said spark discharge and including at least one bank of a plurality of individual capacitors, switch means to selectively connect said bank of capacitors between said electrode and said workpiece, storage capacitor means to provide a sizable reservoir capacitive source to constantly charge said bank of capacitors;

e. said electrode a positioning unit including spark discharge sensing means to monitor the condition of said spark discharge between said electrode and said workpiece; and,

f. said electrode positioning unit further including means to move the electrode toward and away from the workpiece in response to said spark discharge sensing means.

3,969,602
STRUCTURE FOR AND METHOD OF ELECTROEROSION MACHINING

Victor E. Matulaitis, Franklin, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

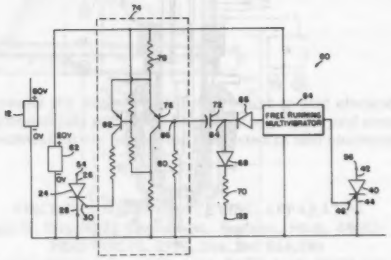
Filed Apr. 1, 1969, Ser. No. 811,719

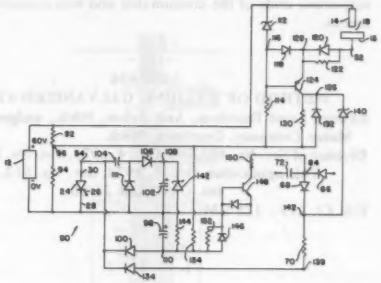
Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 C **5 Claims**

1. A circuit for electroerosion machining comprising a silicon controlled rectifier having anode, cathode and control electrodes, a source of electrical power and an electrode and workpiece in spaced apart relation to provide a machining gap connected in series with the anode and cathode of the rectifier and means connected to the control electrode of the rectifier for positively and rapidly turning the rectifier on and off including a free-running multi-vibrator and means indirectly connecting one side of the multi-vibrator to the control electrode of the rectifier including a Schmitt trigger circuit connected to the rectifier and means for providing a transient signal to actuate the Schmitt trigger circuit in response to a signal pulse from the one side of the multi-vibrator and means for inhibiting the transient signal provided to the Schmitt trigger circuit in response to a pulse from the one side of the multi-vibrator at controlled times.

3. The method of electroerosion machining comprising connecting a power supply, electrode, machining gap, workpiece and silicon controlled rectifier in series, rapidly turning the silicon controlled rectifier on and off, monitoring the machining gap during each machining cycle, preventing conducting of the rectifier in response to recognition of minimum





voltage across the machining gap at the end of a machining cycle, testing the voltage across the machining gap at predetermined intervals after sensing a minimum voltage across the machining gap at the end of a machining cycle to determine if the minimum voltage has increased to a machining voltage and automatically varying the length of time between testing of the voltage across the machining gap in accordance with the length of time a minimum voltage has been present across the machining gap.

3,969,603
PLASMA-MIG ARC WELDING

Peter Boughton, Balsham, and David Bernard Swann Clarke, Horston, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 377,899, July 10, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,187

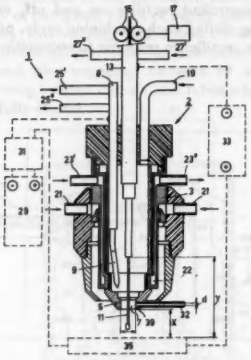
Claims priority, application United Kingdom, July 12, 1972, 32572/72

Int. Cl.² D23K *5/00*

U.S. Cl. 219—121 P **9 Claims**

1. In a method of plasma-MIG arc welding including connecting a first current source across a non-consumable electrode and the workpiece and thereby maintaining a plasma arc in a flow of inert gas between the end of said non-consumable electrode and said workpiece, guiding a consumable electrode coaxially into the plasma stream, connecting a second current source across a consumable electrode and the workpiece and thereby maintaining a MIG arc between the end of the con-

sumable electrode and the workpiece, the improvement in combination therewith comprising introducing an oxidizing



gas stream into the plasma stream in a region intermediate the respective ends of the consumable and non-consumable electrodes.

3,969,604

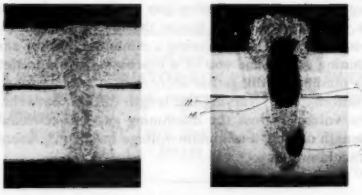
METHOD OF WELDING GALVANIZED STEEL

Edward Lund Baardsen, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 403,590, Oct. 4, 1973, Pat. No. 3,881,084. This application Oct. 4, 1974, Ser. No. 512,391

Int. Cl.² B23K *26/00*

U.S. Cl. 219—121 LM **1 Claim**



1. The product resulting from practicing the method of joining base steel articles, at least one of the articles is coated with a substance having a vapor pressure higher than the base steel article, the steel articles are first mated along at least one zone thereof, secondly a deposit of flux material is located adjacent at least one portion of said zone and is constituted so as to be effective to form a compound with said substance having a boiling and a melting temperature substantially the same or higher than the steel of said base articles and has a vapor pressure substantially the same or less than said base steel articles, and lastly, at least one portion of said zone is subjected to a high energy density beam effective to melt both of said base steel articles in the area of said beam and the flux whereby welding of said articles is obtained, said product is characterized by the absence of voids or porosity.

3,969,605

THERMAL PULSE TYPE HEATER FOR COOLANT SYSTEMS AND THE LIKE

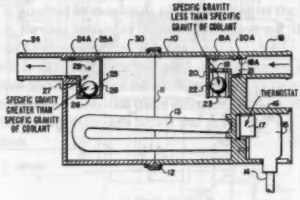
Russell D. Danell, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada

Filed Jan. 23, 1975, Ser. No. 543,308

Claims priority, application United Kingdom, Jan. 29, 1974, 4036/74

Int. Cl.² F02N *17/06;* **H05B** *1/00;* **F24H** *1/10;* **F16K** *15/04*

U.S. Cl. 219—208 **8 Claims**


SPECIFIC GRAVITY LESS THAN SPECIFIC GRAVITY OF COOLANT
SPECIFIC GRAVITY GREATER THAN SPECIFIC GRAVITY OF COOLANT
THERMOSTAT

1. A heater for the coolant of liquid cooled automotive engines and the like comprising in combination a coolant reservoir, a heater element therein operatively connected to a source of electrical energy, an inlet connection and an outlet connection in said reservoir adjacent the upper side thereof, whereby said reservoir may be operatively connected to the coolant system of said engine, said inlet connection including a fluid level, one-way control valve assembly adapted to allow coolant to enter said reservoir, said outlet connection including a one-way valve assembly adapted to allow coolant to leave said reservoir, said inlet valve assembly including a valve seat, a ball valve element below said seat engageable with said seat when said inlet valve assembly is in the closed position, said ball valve element having a specific gravity less than the specific gravity of the coolant whereby said ball valve element floats in said coolant and moves away from said valve seat when the level of coolant drops within said reservoir and moves into engagement with said valve seat when the level of coolant rises within said reservoir, said one-way control valve assembly in said inlet connection including a horizontally situated cylindrical sleeve engageable within a bore forming the inner end of said inlet connection, and a substantially cylindrical shroud extending downwardly substantially at right angles to said sleeve, said valve seat being situated between said sleeve and said shroud and at the upper end of said shroud whereby said shroud communicates with said sleeve, said ball valve element moving freely vertically within said shroud, and means restraining the displacement of said ball valve element from the lower open end of said shroud.

3,969,606

ELECTRICALLY HEATED STYLUS FOR TRANSFERRING A PRINTING MEDIUM

Carlos W. Veach, 8921 Ashcroft Ave., Los Angeles, Calif. 90048

Filed Aug. 5, 1974, Ser. No. 494,473

Int. Cl.² H05B *3/00;* **B43K** *7/00;* **B23K** *3/02*

U.S. Cl. 219—237 **1 Claim**

1. In a device for transferring a printing medium, forming a coating on one face of a sheet of material, and subject to release therefrom upon movement of a heated stylus along the opposite face of the sheet in a desired path, while the medium is in contact with an article to be printed, the improvements, in combination, comprising;

a. a hollow handle adapted to be grasped in the hand of an operator for freehand movement in a path corresponding to the configuration of insignia to be printed,

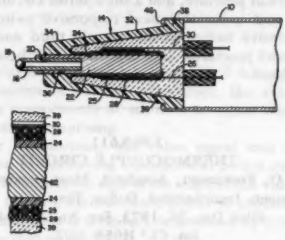
b. said handle having a stylus supporting member extending outwardly from an end thereof formed of electrically insulated material of relatively low heat conductivity,

c. a metallic mandrel carried by said member and having a portion disposed within said member in spaced relation thereto,

d. a layer of electrical insulation surrounding and electrically insulating the surface of said portion,

e. a continuous insulated wire of relatively high electrical resistance wound around said layer in a plurality of abutting coils, said coils forming a heating element for supplying heat to the mandrel through said layer,

f. a metallic stylus comprising the tip portion of a conventional ball point pen extending outwardly from the exposed end of the mandrel, said stylus comprising a metallic tube with a rotatable steel ball secured to the end



thereof, said ball being adapted to roll along said opposite face, the exposed portion of said stylus having an uninsulated electrically conductive outer surface, the stylus being in electrically conductive engagement with said metallic mandrel, said stylus supporting member being hollow and surrounding the heating element in spaced relation thereto, said space being completely filled with a potting material comprising a liquid cement mixture subject to hardening after being delivered to said space,

g. means extending through said handle and connected to the heating element for supplying power thereto, and

h. the construction and arrangement being such that said layer provides back-up insulation between the electrically heated heating element and the mandrel and prevents the introduction of a shocking voltage to the stylus through the mandrel in event of breakdown of the insulation on the heating element.

3,969,607

HAND STEAMING DEVICE WITH AUTOMATIC POWER INTERRUPTING MEANS

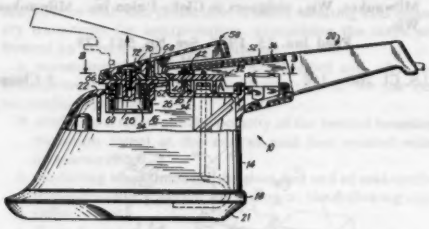
Leonard Osrow, Great Neck, and Jacques L. LeBaigue, Westbury, both of N.Y., assignors to Osrow Products Company Inc., Glen Cove, N.Y.

Filed June 18, 1974, Ser. No. 480,599

Int. Cl.² H05B *1/02, 3/60;* **D06F** *75/08*

U.S. Cl. 219—272 **8 Claims**

1. A hand steaming device comprising a housing, said housing including a reservoir, a pair of spaced apart electrodes located in said reservoir, a fill cap port through which a liquid can be directed to said reservoir, a fill cap for sealing said fill cap port and movable between a position wherein said fill cap seals said fill cap port to a position wherein said fill cap does not seal the fill cap port, said fill cap rotatable in said fill cap port while sealing said fill cap port, switch means connected to said electrodes, and means cooperatively associated with said switch means and said fill cap for selectively controlling the operation of said switch means in response to rotation of said fill cap in said fill cap port and so that when said fill cap is positioned so that it no longer seals said fill cap port said switch means is opened to prevent a source of electrical power which is connected to said switch means from being connected to said electrodes and so that when said fill cap seals said fill cap port said switch means can selectively be closed



to connect the source of electrical power to said electrodes and alternatively selectively be opened to prevent said source of electrical power from being connected to said electrodes.

3,969,608

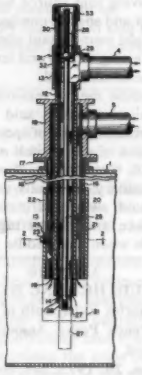
VISCOUS LIQUID CONVEYING APPARATUS

Joseph M. Day, 4231 Elmonte St., Saginaw, Mich. 48603

Filed Oct. 15, 1974, Ser. No. 514,590

Int. Cl.² H05B *1/24;* **F17D** *1/18;* **B67D** *5/62*

U.S. Cl. 219—300 **14 Claims**



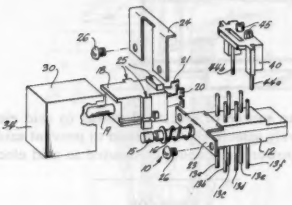
1. Viscous liquid conveying apparatus comprising a tank having a bottom for containing a supply of viscous liquid; a device for receiving liquid from said tank; a supply line extending into said tank toward said bottom and having one end terminating at a predetermined level from said bottom in an open mouth, said supply line having its other end connected to said device; a return line having one end extending into said tank in concentric relation with said supply line and having its other end connected to said device, said one end of said return line terminating in an open mouth adjacent the mouth of said supply line but at a different level from said bottom; means for delivering liquid from said tank to said device via said supply line and for returning liquid from said device to said tank via said return line; means for heating liquid returned to said tank via said return line; a tubular member snugly but slidably fitted on the higher level one of said lines adjacent its mouth for back and forth movements toward and away from the bottom of said tank to adjust the effective length of said higher level one of said lines and thereby the position of its mouth at a selected level above or below the level of the mouth of the other of said lines; and operating means connected to said tubular member for moving the latter.

3,969,609

ILLUMINATED PUSH BUTTON SWITCH

Vernon Walter Wanner, and William Karl Lueschen, both of Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Jan. 15, 1975, Ser. No. 541,328
Int. Cl.[2] H01H 9/00
U.S. Cl. 200—314 9 Claims



1. An illuminated electrical switch comprising:

a switch mechanism having a selector element extending from one end and two or more conductive switch terminals located in proximity to the other end of said switch mechanism;

housing means coupled to said switch mechanism for containing a light source, said housing means including a socket for receiving said source located adjacent to said selector element and spaced conductive connector means engaging said light source, said connector means extending from said housing means and terminating in proximity to said switch terminals; and

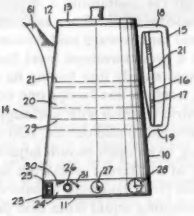
nonconductive saddle means removably mounted on said switch mechanism adjacent said housing means, said saddle means including pair of spaced auxiliary terminals spanning the sides of said switch mechanism and spaced from said switch terminals, said connector means contacting said auxiliary terminals and being held out of contact with said switch terminals when said saddle means is in place and contacting at least one of said switch terminals when said saddle means is removed.

3,969,610

LIQUID HEATING DEVICE

Helen Ratti, and Charles Ratti, both of North Babylon, N.Y., assignor to Lawrence Peska Associates Inc., New York, N.Y., a part interest

Filed Jan. 20, 1975, Ser. No. 542,434
Int. Cl.[2] F27D 11/02
U.S. Cl. 219—441 2 Claims



1. A liquid heating device, which comprises:

a. a cylindrically shaped container having a closed base, an upwardly extending cylindrically shaped sidewall, an interior chamber therein, wherein a pouring spout and a U-shaped handle communicate with said sidewall;

b. a removable top lid cover communicating with an open top end of said container; said container and said lid cover being of thermally and electrically insulating material;

c. a control panel contained on a bottom outside periphery of said sidewall;

d. an inlet receptacle, a two way switch assembly, a light unit and a timer assembly contained in said control panel; and

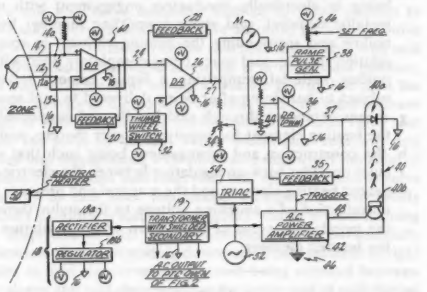
e. an interior electrical heating element within said interior chamber electrically communicating in an electric circuit, said electric circuit including a first series circuit of a power source, said two way switch, a first electrical juncture, a thermostatic unit in fluid contact with a liquid adapted to be received in said interior chamber, a second electrical juncture, said heating element, a third electrical juncture, and a fourth electrical juncture, a second series circuit of a fifth electrical juncture and said timer assembly joined between said switch assembly and said first electrical juncture, and a third series circuit of said light unit and a variable heat responsive switch, said heat responsive switch joined to said third and said fourth electricl junctures, said electric circuit being electricaly insulated.

3,969,611

THERMOCOUPLE CIRCUIT

Norman O. Fonteneau, Acushnet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,942
Int. Cl.[2] H05B 1/02
U.S. Cl. 219—502 6 Claims



1. In a thermocouple circuit wherein two dissimilar conductors define a transducer for generating a thermal e.m.f. proportional to the temperature difference between said transducer and the electrically connected reference junction of said dissimilar conductors the improvement comprising:

a. A thermal stable environment means providing a reference temperature for forming a thermocouple reference junction,

b. A source of electrical energy for generating a voltage which is referenced to a stable common potential,

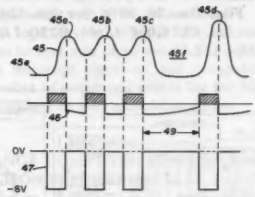
c. Amplifying means for said thermal e.m.f., said amplifying means driven from said electrical energy source, and said amplifying means having its output referenced to said stable common potential said amplifying means disposed in said thermal stable environment means, and

d. An optical coupling device for isolating the output of said amplifying means from ground potential.

3,969,612
BAR CODE READER ENHANCEMENT

Robert B. McJohnson, Dallas, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed June 11, 1974, Ser. No. 478,238
Int. Cl.² H03K *5/01, 6/06;* **G06K** *7/14*
U.S. Cl. 235—61.11 E **12 Claims**



1. Apparatus for processing a video signal derived from bar coded documents of varying reflectance, the video signals having noise components in addition to signal components, the combination comprising:

means for transforming the video signal into amplitude truncated pulses having transitions at points corresponding to a change in the sign of the slope of the video signal,

means for filtering the truncated pulses to produce a dump signal pulse train at a bit rate determined by transitions of the truncated pulses,

means for integrating the truncated pulses and responsive to the dump signal to provide at the output thereof a pulse train at the integration level of the truncated pulses and synchronized at the bit rate,

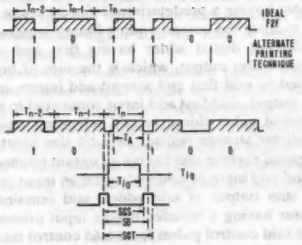
a threshold detector responsive to the output of said means for integrating to provide an output control signal when the integration level of the truncated pulses exceeds a preset level, and

a bistable output means responsive to the output control signal to provide an output at one of two levels.

3,969,613
TWO FREQUENCY CODED DATA INTERPRETING METHOD AND APPARATUS

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,572
Int. Cl.² G06K *7/00*
U.S. Cl. 235—61.11 R **22 Claims**



1. A method of operating an F2F coded data decoder apparatus for interpreting F2F coded data received thereby to extract therefrom its correct digital content whenever each multibit data block received at said decoder is preceded by at least a first or preamble symbol having two double frequency time slots, or nominal half-symbol widths bounded by single frequency signals, by predicting from the end of said preamble symbol the time at which the next single frequency symbol boundary transition should occur, and controlling the duration of a period of searching by said decoding apparatus for any said single frequency symbol boundary transitions in accordance with said prediction, thereby isolating said boundary transitions for interpretation, comprising the steps performed by means in said apparatus of:

a. measuring the width of said first symbol and, after said measurement is completed, reinitiating step a) for the next succeeding symbol;

b. storing as a reference the polarity of the symbol boundary transition signal at the end of said first symbol width measurement;

c. predicting ideal times for the start and end of said symbol boundary search period according to the following algorithm:

a. $T_w = T_{n-1}(1 \pm \alpha)$

where α is a variable coefficient arbitrarily chosen from the range 0 to ½ and being optimum at $\alpha = ¼$, T_w is the predicted ideal dimensions for said symbol boundary search time, and T_{n-1} is the last and said symbol width measurement;

d. during said search period, sensing the next symbol boundary transition signal, storing the polarity of said signal in a temporary storage, comparing the polarity of said transition with said reference polarity and, if said polarities correspond, entering a one into a data register, terminating said reinitiated symbol width measurement, and reinitiating said symbol width measurement for the succeeding symbol, but if said polarities do not correspond, entering a "zero" into said data register; and terminating said reinitiated symbol width measurement, and reinitiating said symbol width measurement;

e. storing the polarity contents of said temporary storage as the next said reference polarity and continuing operation from step c).

3,969,614
METHOD AND APPARATUS FOR ENGINE CONTROL

David F. Moyer, Ann Arbor; Shaun S. Devlin, Birmingham, and Richard J. Genik, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1973, Ser. No. 423,968
Int. Cl.² G05B *13/02, 15/02*
U.S. Cl. 235—150.21 **18 Claims**

1. A method for controlling a combustion engine used in a process of converting heat energy, released by the combustion of a fuel, into mechanical energy, said engine having an output shaft which rotates while it is in operation and including at least one means for controlling said energy conversion process, said method comprising the steps of:

generating an electrical signal in the form of a binary number, said signal being indicative of a condition of said engine as of a selected instant in time during which said engine is operative in effecting said energy conversion process; then

arithmetically calculating a value corresponding to a setting of said means for controlling said energy conversion process, said calculating being performed using said binary number electrical signal, by a digital computer programmed to calculate said value from an algebraic function or functions describing a desired relationship between said engine condition and said means for controlling said energy conversion process; then

with an electrical circuit coupled between said digital computer and said means for controlling said energy conversion process, converting said calculated value into a setting of said means for controllng said energy conversion process; and thereafter

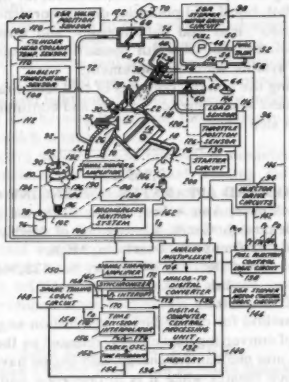
while said engine is in operation, continuously repeating the above sequence of steps at uniform angular intervals of rotation of said engine output shaft to effect changes in the settings of said means for controlling said energy conversion process in response to changes in said binary number electrical signal indicative of said engine condition.

11. A method for controlling a combustion engine used in a process of converting heat energy, released by the combustion of a fuel, into mechanical energy, said engine including at least first and second means for controlling said energy conversion process, said method comprising the steps of:

generating an electrical signal in the form of a binary number, said signal being indicative of a condition of said engine as of a selected instant in time during which said engine is operative in effecting said energy conversion process; then

arithmetically calculating a first value corresponding to a setting of said first means for controlling said energy conversion process, said calculating being performed, using said binary number electrical signal, by a digital computer programmed to calculate said first value from an algebraic function or functions describing a desired relationship between said engine condition and said first means for controlling said energy conversion process;

arithmetically calculating a second value corresponding to a setting of said second means for controlling said energy conversion process, said calculating being performed, using said calculated value corresponding to a setting of



said first means for controlling said energy conversion process, by said digital computer programmed to calculate said second value from an algebraic function or functions describing a desired relationship between settings of said first and second means for controlling said energy conversion process;

with a first electrical circuit coupled between said digital computer and said first means for controlling said energy conversion process, converting said calculated first value into a setting of said first means for controlling said energy conversion process;

with a second electrical circuit coupled between said digital computer and said second means for controlling said energy conversion process, converting said calculated second value into a setting of said second means for controlling said energy conversion process; and thereafter

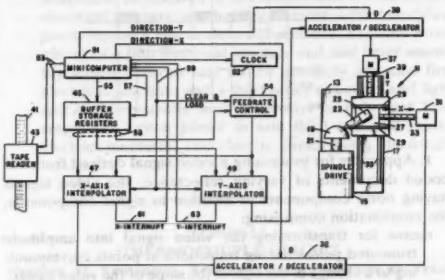
while said engine is in operation, continuously repeating the above sequence of steps to effect changes in the settings of said first and second means for controlling said energy conversion process in response, respectively, to changes in said binary number electrical signal indicative of said engine condition and in said calculated first value.

3,969,615

INTERPOLATOR FOR NUMERICALLY CONTROLLED MACHINE TOOLS

Gary L. Bowers, Clinton; Clyde M. Davenport, Oak Ridge, and Albert E. Stephens, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 534,937
Int. Cl.[2] G06F 15/46; B23Q 11/18
U.S. Cl. 235—151.11 6 Claims



1. In combination with a positioning system for automatic positioning of at least one positionable member driven by a drive means along an axis at a rate responsive to the rate of command pulses applied to said drive means and including a computer having a data storage means for storing descriptive data in the form of a plurality of data blocks of binary values each relating to a particular motion to be achieved by said positionable member within a prescribed time frame, an interpolator for accepting said descriptive data one block at a time and generating said command pulses sepecified by a data block within the prescribed time frame, comprising:

a first digital integrator means for receiving and storing a first binary integrand value from said computer of the particular one of said data blocks being executed and producing a first train of pulses according to the integral of said first binary integrand value with respect to said prescribed time frame;

a second digital integrator means for receiving a second binary integrand value from said computer of said particular data block being executed and producing a second train of pulses according to the integral of said second binary integrand value with respect to said prescribed time frame, each of said integrators includes an integrand register having a predetermined fixed bit size and operative to store the corresponding binary integrand value, a parallel bit digital adder having first and second add inputs, a sum output, which is the sum of binary values applied to said first and second add inputs and an overflow output, said first add input connected to receive said integrand value stored in said integrand register, and a remainder storage register of a bit size identical to said integrand register and having an output connected to said second add input of said adder and an input connected to said sum output of said adder, said remainder storage register having a transfer trigger input connected to receive said control pulses from said control means, so that upon receiving a control pulse the remainder value stored in said remainder storage register is added to said integrand value and the sum is reloaded into said remainder storage register;

means responsive to said first train of pulses for incrementing said second integrator integrand at a selected bit position so as to continually change the integrand value of said second integrator with respect to said prescribed time frame according to the integral value of said first integrator;

control means for accepting a binary time value from said computer, the magnitude of which controls the rate of generation of said first and second train of pulses within said time frame for the particular data block being executed and generates control pulses to said first and second integrators to effect integration of said integrand values according to said time frame;

output circuit means for applying said second train of pulses to the corresponding axis drive means; and

an end-of-block interrupt signal generating means for sensing the pulses to said axis drive means and generating an end-of-block interrupt signal to said computer when a specified number of command pulses for the block being executed is applied to said axis drive means.

3,969,616

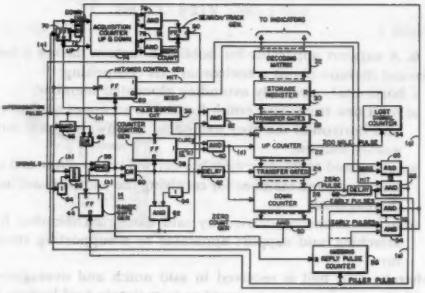
DIGITAL RANGE COMPUTER SYSTEMS FOR AIR NAVIGATION SYSTEMS SUCH AS TACAN

Frederick J. Mimken, Fairport, N.Y., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed June 29, 1965, Ser. No. 467,897

Int. Cl.² G01S 9/18; H03K 5/20

U.S. Cl. 235—151.32 **15 Claims**



1. A computer system for calculating the range between two stations which are in radio communication with each other, said system comprising:

a. calculation means for producing an output having a value corresponding to the elapsed time between the transmission of a signal from a first of said stations to a second of said stations and the reception of a signal transmitted from said second station to said first station in reply to said first station transmitted signal,

b. control means for supplying information to said calculation means respecting time of the occurrence of said first station transmitted signal and the time of reception of said reply signal, and

c. means operated by said calculation means when said calculation means output equals an expected value for operating said control means to supply information simulating the information respecting the reception of reply signals to said claculation means whereby to maintain the operation of said calculation means on a continuing basis notwithstanding that said reply signals are missing.

3,969,617

MULTICHANNEL DIGITAL MODULATOR

Sylvain Fontanes, Chatou, France, assignor to Compagnie Europeenne de Teletransmission (C.E.T.T.), Chatou, France

Filed Apr. 8, 1975, Ser. No. 566,512

Claims priority, application France, Apr. 12, 1974, 74.13068

Int. Cl.² H03C 5/00

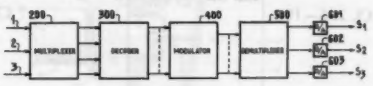
U.S. Cl. 235—152 **7 Claims**

1. A digital modulator adapted for receiving n input binary digital signals S_i, $i = 1, 2 \ldots n$, n being an integer greater than one, said modulator comprising

a memory in which coded binary words representative of samples of a sinusoidal signal are stored, said memory having an address input and an output;

n channel circuits for respectively grouping the successive bits of each input signal S_i in groups of P_i bits, each P_i being a positive integer, said n channel circuits having respective outputs;

a multiplexing circuit, having an output, and comprising means for sampling the output groups of said n channel circuits, a sample of a group being formed by sampling each bit of this group, and the sampling of the n channel



output groups being performed cyclically, said multiplexing circuit thus delivering at its output a multiplexed signal comprising a plurality of samples of each of said groups, a group having given rise to a sample being termed the parent group of this sample;

a coding arrangement having an input coupled to the output of said multiplexing circuit and an output coupled to said address input for delivering to said address input, for each sample included in said multiplexed signal, an address signal and means for successively reading the coded words respectively corresponding to the successive address signals.

3,969,618

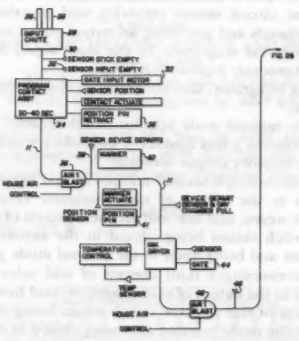
ON LINE PROM HANDLING SYSTEM

John Michael Strubel, Rancho Palos Verdes; Don Minoru Mizota, Panorama City; Michael Tung, Culver City; Alfred Watson Sanborn, North Hollywood; Richard Dale McNair, Rancho Palos Verdes; Jefferson Frank Forte, Whittier, and William Lawrence Scheding, Marvista, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 29, 1974, Ser. No. 528,241

Int. Cl.² G11C 29/00; G06F 11/04

U.S. Cl. 235—153 AC **25 Claims**



1. Apparatus for automatically programming and testing a programmable read-only memory (PROM) device of the type having a fuse corresponding to every bit in memory, the selective blowing of said fuses by the application of electrical pulses constituting the programming of said PROM, comprising:

means electrically coupled to said PROM for programming said PROM with a predetermined bit pattern by the selective blowing of said fuses,

means electrically coupled to said PROM for testing the access time required for said PROM to output said bit

pattern contained within said PROM after completion of said programming, and

means for transporting said PROM to said means for programming and to said means for testing.

3,969,619

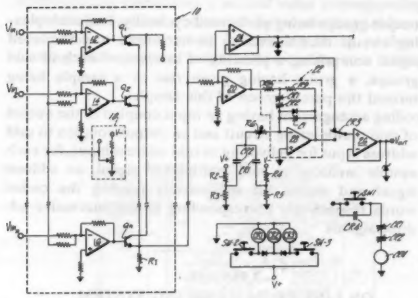
ANALOG SERVO MEMORY

Mohamed A. R. El-Ramly, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 13, 1975, Ser. No. 549,721

Int. Cl.² G06G 7/18

U.S. Cl. 235—183 7 Claims



1. An analog servo memory, said memory having an output terminal and receiving a plurality of input signals in the form of variable direct current potentials, said memory comprising:

maximum value selector circuit means, said maximum value selector circuit means receiving said plurality of said input signals and providing an output signal commensurate with the magnitude of the input signal having the instantaneously highest magnitude;

an analog integrator, said integrator having an input and an output;

automatic-manual mode selector switch means;

means coupling a first contact of said selector switch means to the memory output terminal;

means connecting a second contact of said selector switch means to the output of said maximum value selector circuit means, said first and second contacts of said selector switch means being closed in the automatic mode position and being open in the manual mode position;

means connecting a third contact of said selector switch means to the output of said integrator, said first and third contacts of said selector switch means being open in the automatic mode position and being closed in the manual mode position;

means for selectively delivering the output signal provided by said maximum value selector circuit means to the input of said integrator, said selective delivering means isolating the integrator from the maximum value selector circuit means output signal when said selector switch means is in the manual mode position; and

means for selectively varying the magnitude of the signal appearing at the output of said integrator independently of the value of input signals applied to said maximum value selector circuit means.

3,969,620

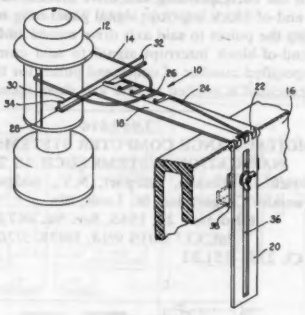
LANTERN SUPPORT APPARATUS

Charles R. Brooks, Rte. 1, White Horse Road, Greenville, S.C. 29611

Filed June 4, 1975, Ser. No. 583,762

Int. Cl.² F21V 21/14; F16M 11/00

U.S. Cl. 240—7.5 6 Claims



6. A support apparatus for holding a lantern having a bail pivoted thereon about a horizontal axis comprising:

a horizontal outwardly extending elongated member;

at least one transverse notch formed in an upper surface of said horizontal member extending downwardly and outwardly therein;

an elongated transverse member carried on an outer end of said elongated member for receiving the width of said bail thereagainst;

attachment means carried by said elongated member for attaching said support apparatus to a supporting structure;

whereby said bail is received in said notch and overagainst said elongated transverse member to maintain said lantern in an upright position as it freely pivots about its bail while supported thereby.

3,969,621

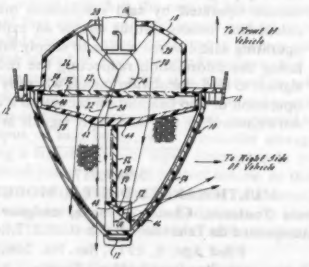
MOTOR VEHICLE LIGHT ASSEMBLY UTILIZING TOTAL INTERNAL REFLECTION

Richard M. Ferrell, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 18, 1974, Ser. No. 525,034

Int. Cl.² F21V 7/00

U.S. Cl. 240—41.35 C 6 Claims



1. A light assembly for a motor vehicle, said light assembly being designed to project light both in the longitudinal direction of said motor vehicle and in a direction transverse to said motor vehicle, said light assembly comprising:

a light source;

a parabolic reflector, said light source being positioned at the focal point of said parabolic reflector and said parabolic reflector defining a general direction of light projection;

a lens made from a transparent material, said lens having a plane surface and a surface having a plurality of optics, said lens surface having a plurality of optics including certain portions interspersed among said optics, said surface portions being flat and parallel to said plane surface of said lens, thereby, to permit light rays entering said lens at said surface portions to be transmitted through said lens, said optics being of a type capable of producing total internal reflection of light rays entering said lens from the direction of said parabolic reflector and said light source, and said optics projecting said totally internally reflected light rays in a direction substantially transverse to said general direction.

3,969,622

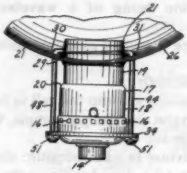
SOCKET LOCKING STRUCTURE

Neil W. Brandt, 55 Laron Drive, New Rochelle, N.Y. 10804

Filed June 19, 1975, Ser. No. 588,216

Int. Cl.² F21V *7/00, 17/06*

U.S. Cl. 240—140 **1 Claim**



1. In a combination lamp socket and reflector assembly of a type in which a socket element includes a cup-like base and a cylindrical sleeve maintained in assembled relation with said base by resilient detent means, said reflector being carried by said sleeve, improved means for maintaining said assembly in integrated condition comprising: a planar ring-like base member having a generally centrally disposed opening of diameter less than that of said cup-like base of said socket element, said base member having a pair of openings therein bordering said centrally disposed opening; and a looped wirelike member having free ends thereof penetrating and secured within said pair of openings in said base member; said reflector having a pair of correspondingly spaced openings therein, said looped member passing through said openings in said reflector, whereby said reflector is retained upon said sleeve against rotational and longitudinal movement, and said sleeve is maintained in assembled condition within said socket, irrespective of the engagement of said resilient detent means.

3,969,623

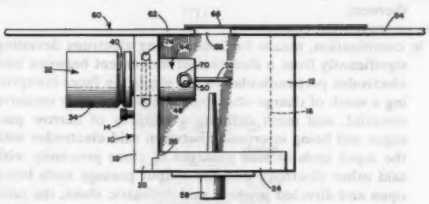
VARIABLE TEMPERATURE FLAT PLATE POWDER DIFFRACTION CAMERA

Theodore J. Klingen, Oxford, Miss., and John H. Kindsvater, Reno, Nev., assignors to The University of Mississippi, University, Miss.

Filed Jan. 10, 1975, Ser. No. 540,219

Int. Cl.² G01N *23/20*

U.S. Cl. 250—275 **11 Claims**



1. A camera including a source of X-ray radiation for obtaining X-ray diffraction photographs of a powder specimen comprising:

a support assembly having a first and second axis, said first axis being transverse to said second axis;

first means mounted to said support assembly for forming a collimated beam of X-radiation, said collimated beam directed parallel to said first axis;

second means mounted to said support assembly for mounting a powder specimen having a longitudinal axis thereof set parallel to said second axis, said second means maintaining the specimen in an area for impingement by said collimated beam of X-radiation for producing a plurality of diffracted X-rays;

a flat-plate photographic film slidably supported in an attitude transverse said first axis and responsive to said diffracted X-rays for recording said diffracted X-rays; and

a planar shield assembly secured to said support assembly for shielding said photographic film from a portion of said diffracted X-rays, said planar shield assembly permitting at least recording of said diffracted X-rays about the intersection of said first axis and said film.

3,969,624

ELECTROSTATIC IMAGING DEVICE AND PROCESS USING SAME

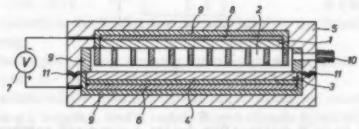
Jozef Antoon Van Biesen, Boechout, and Jan Van den Bogaert, Schilde, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 420,557, Nov. 30, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,575

Claims priority, application United Kingdom, May 21, 1973, 24169/73

Int. Cl.² G03B *41/16*

U.S. Cl. 250—315 R **8 Claims**



1. In a radiographic system for the operation with a source of X-rays which comprises:

a. an imaging chamber;

b. a pair of generally flat electrodes arranged in spaced substantially parallel relation in said chamber and defining a gap therebetween;

c. means in said chamber for emitting a pattern of electrostatic charges when exposed to an X-ray image and including an ionizing gas medium filling at least said gap between said electrodes at a pressure of at least about 0.1 Torr;
d. a removable sheet of dielectric material disposed in said gap adjacent one of said electrodes; and
e. means for applying a high voltage electrical potential across said electrodes for biasing said pattern of electrostatic charges towards said dielectric sheet for deposit thereon;

the improvement comprising

in combination, means for intercepting electrons deviating significantly from a direction of movement between said electrodes perpendicular to the electrode faces comprising a mesh of charge-absorbing non-secondarily emissive material, said mesh defining a plurality of narrow passages and being interposed between said electrodes with the input ends of said passages in close proximity with said other electrode and the output passage ends being open and directed towards said dielectric sheet, the ratio of the cross-sectional diameter to the length of the individual narrow passages being at least 1:4.

3,969,625

X-RAY SPOT FILM DEVICE WITH MEANS FOR ORGANWISE-PROGRAMMED SETTING OF X-RAY EXPOSURE DATA

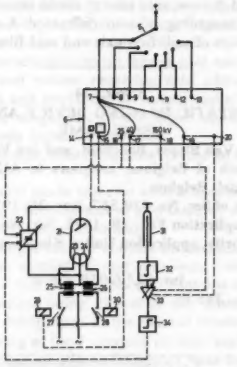
Johann Finkenzeller; Peter Grassmann, both of Erlangen, and Peter Skarke, Uttenreuth, all of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Feb. 20, 1974, Ser. No. 444,245

Claims priority, application Germany, Apr. 13, 1973, 2318781

Int. Cl.² G03B 41/16

U.S. Cl. 250—322 **6 Claims**



1. In an X-ray spot film device, a command component, and switching means on said command component for effecting the concurrent organwise-programmed setting of a plurality of X-ray exposure data, the improvement comprising; said switching means comprising a multiple-position rotary step switch, each position of said rotary step switch being associated with a predetermined body organ of a patient whereby rotation of said switch to a respective position automatically concurrently selects a plurality of exposure data for X-raying said body organ.

3,969,626

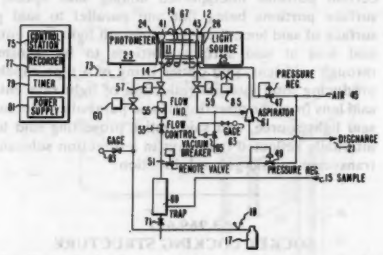
METHOD AND APPARATUS FOR DETECTING TOTAL REDUCED SULFUR

Robert S. Saltzman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 18, 1975, Ser. No. 550,852

Int. Cl.² G01J 1/00

U.S. Cl. 250—344 **13 Claims**



1. A method for determining the total reduced sulfur content of a gas comprising the steps of:
a. introducing a sample of the gas into a sample cell;
b. passing detecting radiation of a wavelength between about 250 to about 330 nm. through the gas sample in the cell, said detecting radiation being of a wavelength strongly absorbed by SO_2;
c. measuring the intensity of the detecting radiation passing through the gas sample;
d. sealing the gas sample in the cell;
e. introducing an oxygen-containing gas into the cell to form a gas mixture containing oxygen and the gas sample, said gas mixture being retained in the cell;
f. thereafter heating the gas mixture to a temperature above about 200°C. to oxidize the total reduced sulfur in the gas sample;
g. passing the detecting radiation through the heated gas mixture in the cell; and
h. measuring the intensity of the detecting radiation passing through the gas mixture; the difference between the intensity of the detecting radiation passing through the gas mixture and that passing through the gas sample alone being indicative of the total reduced sulfur content of the sample gas.

3,969,627

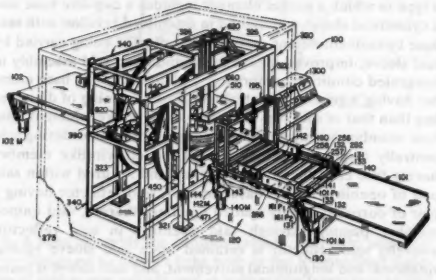
SYSTEM OF POSITIONING AND INSPECTING TIRES

Donald N. Heisner, Euclid, Ohio, and Phillip K. Loyer, Waynesville, N.C., assignors to Picker Corporation, Cleveland, Ohio

Filed Aug. 7, 1974, Ser. No. 495,448

Int. Cl.² G01N 23/00

U.S. Cl. 250—358 T **83 Claims**



1. A method of inspecting a plurality of tires, through the use of penetrative emanation where at least one of the tires

differs in size from at least one other of the tires, comprising the steps of:

a. feeding tires to be inspected along a feed path;

b. sequentially positioning such tires one at a time in an inspection station with the central axis of each positioned tire substantially coincident with a predetermined line and with the central plane of each positioned tire substantially coincident with a predetermined plane;

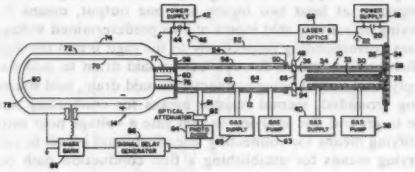
c. inspecting such positioned tire without substantially moving the central plane and the central axis of such tire, by passing penetrating emanation through portions of the positioned tire to form an image of such portions.

3,969,628

INTENSE, ENERGETIC ELECTRON BEAM ASSISTED X-RAY GENERATOR

Thomas G. Roberts; Romas A. Shatas; Harry C. Meyer, III, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,864
Int. Cl.[2] H01J *35/00*
U.S. Cl. 250—402 **6 Claims**



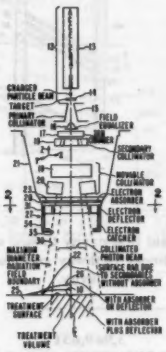
1. An electron beam assisted x-ray generator comprising a plasma generator; a source of high energy electrons; and a sealed beam forming and guiding section interconnecting said source of high energy electrons and said plasma generator; and control means for the plasma generator, the sealed beam forming and guiding section, and the source of high energy electrons, said plasma generator having a chamber therein that is filled with a gas including hydrogen and said gas being subjected to high Z material in said plasma generator chamber to cause x-rays to be produced from the interaction of a hot plasma produced by the plasma generator and electrons from said source of high energy electrons, said beam forming and guiding section being a sealed linear pinch tube device and said control means for said beam forming and guiding section and said plasma generator including a chargeable capacitor bank for each of said beam forming and guiding section and said plasma generator, and control means for simultaneously firing each said capacitor bank to cause said plasma generator to produce a plasma and said sealed linear pinch tube device to produce a current sheath for guiding electrons from said source of high energy electrons to said hot plasma, said control means for said source of high energy electrons including means responsive to the current sheath produced in said sealed linear pinch tube device to cause said source of high energy electrons to be emitted in reponse to a predetermined current sheath condition being established, and said sealed linear pinch tube device being filled with a gas selected from argon and helium.

3,969,629

X-RAY TREATMENT MACHINE HAVING MEANS FOR REDUCING SECONDARY ELECTRON SKIN DOSE

Raymond D. McIntyre, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 14, 1975, Ser. No. 558,392
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—503 **9 Claims**



1. In an x-ray treatment machine:

means for producing a field of x-ray radiation for application to a body for treatment thereof;

means for shaping the field of x-ray radiation as applied to the body, said field shaping means producing contamination of the radiation field of x-ray radiation with high energy secondary electrons which can substantially increase the undesirable electron portion of the total dosage of radiation delivered to the surface of the body being treated; and

electron deflection means for interposing in the electron contaminated field of x-ray radiation an electron deflecting flux for deflecting the contaminating electron trajectories and spreading the electron radiation dose rate out more uniformly over the treated surface, whereby the maximum central axis surface radiation dose rate due to the irradiation of the body with contaminating secondary electrons is reduced in use.

3,969,630

METHOD AND APPARATUS FOR DEFINING RADIATION-OPAQUE PATHWAYS WITHIN SHIELDING MATERIALS

Obie M. Langford, and Michael Bagnasco, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,340
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—515 **8 Claims**

1. A radiation shield, for use in well logging applications, comprising:

a. a fluid tight tubular housing member or sonde sized and adapted for passage through a well borehole;

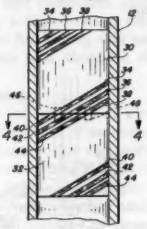
b. a substantially cylindrical radiation shielding member having a length L and a radius R and closely fitted within said sonde;

c. a first cavity within said sonde on one side of said substantially cylindrical shielding member;

d. a second cavity within said sonde on the opposite side of said substantially cylindrical shielding member from said first cavity; and

e. substantially helical groove means on the surface of said substantially cylindrical shielding member, having a pitch

approximately equal to L and a depth D which is small relative to R and extending longitudinally along the external surface of said substantially cylindrical shielding



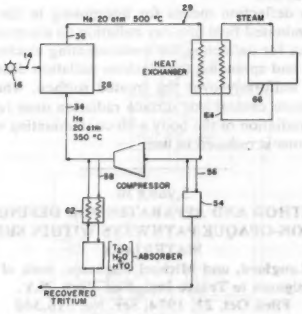
member from said first cavity to said second cavity, and forming a non-linear pathway communicating said first cavity with said second cavity.

3,969,631

GAS PRODUCTION APPARATUS

Warren E. Winsche; Francis T. Miles, both of Bellport, and James R. Powell, Wading River, all of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 20, 1975, Ser. No. 560,430
Int. Cl.² B01K *1/00*; B01J *1/10*
U.S. Cl. 250—527 **15 Claims**



1. Tritium gas producing apparatus for use with a source of neutrons comprising means consisting of:

a. solid lithium target means for receiving the neutrons so as to produce tritium that diffuses through the solid lithium means; and

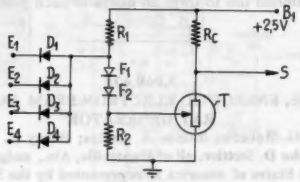
b. sintered aluminum product cooling means interposed between the solid lithium target means and the source of neutrons for containing gas coolant that circulates under pressure through the cooling means in contact with the solid lithium target means to separate and remove the tritium that escapes from the solid lithium means by said diffusion.

3,969,632

LOGIC CIRCUITS-EMPLOYING JUNCTION-TYPE FIELD-EFFECT TRANSISTORS

Albert Bobenrieth, Paris, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 267,213, June 28, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 510,985
Claims priority, application France, July 6, 1971, 71.24683
Int. Cl.² H03K *19/08, 19/34, 19/12*; H01L *29/80*
U.S. Cl. 307—205 **3 Claims**



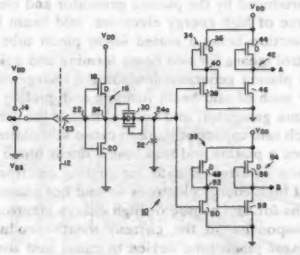
1. A logic circuit integrated upon a semi-insulating substrate comprising a d.c. supply, a junction type field-effect transistor having ion implanted source drain and channel regions, having a predetermined type of conductivity and a metal gate forming with said channel a Schottky junction, said channel having a thickness equal to that of the depletion zone produced by a zero potential applied to said gate junction, said logic circuit comprising at least two inputs and one output, means for carrying selectively said inputs at two predetermined voltage values corresponding respectively to the digit 0 and the digit 1, first resistor means for connecting said drain to said d.c. supply, said output being connected to said drain, said source being grounded, second resistor means for connecting said gate to ground, for applying to said gate a voltage near zero; rectifying means for connecting selectively said inputs to said carrying means for establishing a first conduction path between at least one of said inputs and said supply where said at least one input is at the 0 level, means for establishing a second conductive path between said d.c. supply and the ground, where all the rectifying means are not conductive, and giving to said gate a voltage rendering said transistor conductive.

3,969,633

SELF-BIASED TRINARY INPUT CIRCUIT FOR MOSFET INTEGRATED CIRCUIT

Robert John Paluck, Carrollton, and Robert James Proebsting, Richardson, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Jan. 8, 1975, Ser. No. 539,392
Int. Cl.² H03K *19/08, 19/40, 17/18*
U.S. Cl. 307—205 **9 Claims**



1. In an integrated MOSFET circuit, a trinary to binary input circuit comprising:

a bias stage comprised of a first inverter stage having an input connected to receive a logic input to the integrated circuit and an output electrically common with the input;

a second inverter stage having a beta ratio greater than that of the first stage and having an input connected to the output of the first stage; and

a third inverter stage having a beta ratio less than that of the first stage and having an input connected to the output of the first stage;

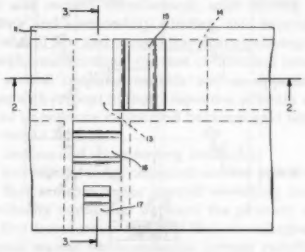
whereby when the logic input is an open circuit, the logic output of the second inverter stage will be at one binary logic level and the output of the third inverter stage will be at another binary logic level, and when the logic input is at a logic 1 level the outputs of both the second and third inverter stages will be at one binary logic level and when the logic input is at a logic 0 level the outputs of both the second and third inverter stages will be at another binary logic level.

3,969,634

BUCKET BACKGROUND SUBTRACTION CIRCUIT FOR CHARGE-COUPLED DEVICES

Stephen C. Su, Huntington Beach, and Ronald M. Finnila, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 31, 1975, Ser. No. 601,124
Int. Cl.² G11C *19/28;* **H01L** *29/78*
U.S. Cl. 307—221 D **6 Claims**



1. A charge coupled device circuit for removing a predetermined quantum of charge from a packet of charge in a charge coupled device plural phase clock voltage driven shift register to reduce the DC offset component of a signal passing through said shift register, said circuit comprising:

a. a semiconductor substrate;

b. an insulation layer on said substrate;

c. a diffused junction charge drain means in said substrate;

d. first and second juxtaposed charge storage locations in said substrate respectively having first and second electrode means associated therewith, each said electrode means being spaced by said insulation from said substrate and being positioned to define a potential well in said substrate for charge storage;

e. means to supply input charge to a first side of said first charge storage location;

f. signal control means comprising a third electrode positioned for controlling the potential barrier between a second side of said first charge storage location and a first side of said second charge storage location for extracting the AC signal representing variable magnitude component of charge from said first charge storage location and transferring it to said second charge storage location; and,

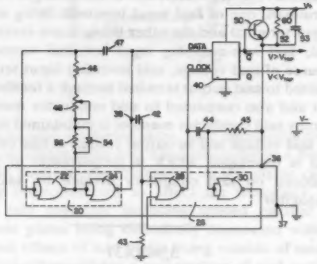
g. channel switch means comprising a fourth electrode positioned for controlling the potential barrier between said diffused junction charge drain means and a third side of said first charge storage location which is juxtaposed to said diffused junction charge drain means for extracting the DC uniform background representing component of charge from said input charge in said first charge storage location by transfer through said diffused junction charge drain means.

3,969,635

VOLTAGE CONDITION MONITOR

William G. Wilke, 641 E. Dayton St., Madison, Wis. 53703

Filed Feb. 25, 1974, Ser. No. 445,339
Int. Cl.² H02H *3/24, 7/18*
U.S. Cl. 307—235 R **6 Claims**



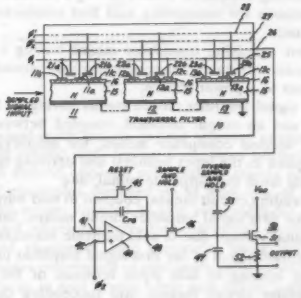
1. A low power apparatus for monitoring a variable supply voltage comprising a first means for producing a digital signal in response to the voltage level of the variable supply voltage, a second means for producing a digital signal also in response to the voltage level of the variable supply voltage, the digital signal of one of the first and second means varying to a greater degree than the digital signal of the other of said means in response to the same voltage level variation, and a comparison means for comparing the two digital signals and thereby determining supply voltage level information.

3,969,636

CHARGE SENSING CIRCUIT FOR CHARGE TRANSFER DEVICES

Richard D. Baertsch, Scotia; Jerome J. Tiemann, Schenectady, and William E. Engeler, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 30, 1975, Ser. No. 591,636
Int. Cl.² H03K *5/20*
U.S. Cl. 307—235 H **4 Claims**



1. In combination,

a substrate of one conductivity type semiconductor material.

an insulator overlying said substrate,

a conductor member overlying said insulator member,

means for applying a voltage between said conductor member and said substrate to deplete a portion of said substrate underlying said conductor member of majority carriers,

means for introducing charge in the form of minority carriers corresponding to a signal into said depleted portion of said substrate,

means for maintaining said voltage constant while sensing the charge flow into said conductor member including a high gain differential amplifier having a pair of input terminals and an output terminal the voltage at which is responsive to the difference in the voltages at said input terminals, one of said input terminals being an inverting input terminal and the other being a non-inverting terminal, said non-inverting input terminal connected to a source of said voltage, said inverting input terminal connected to said output terminal through a feedback capacitor and also connected to said conductor member,

whereby said conductor member is maintained substantially at said voltage and an output voltage at said output terminal is developed which is proportional to the charge induced on said conductor divided by said feedback capacitor.

3,969,637

TRANSISTOR CIRCUIT

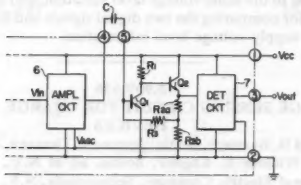
Norio Minami, Katsuta, and Mitsuya Sato, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 432,326, Jan. 10, 1974, abandoned. This application June 25, 1975, Ser. No. 590,377

Claims priority, application Japan, Jan. 10, 1973, 48-5244

Int. Cl.[2] H43K *17/00*

U.S. Cl. 307—237 **3 Claims**



1. A circuit comprising:

a first and a second conductor means each having substantially no resistance;

a grounding conductor means having a substantial parasitic resistance for connecting said first conductor means to ground;

a power supplying conductor means having a substantial parasitic resistance for connecting said second conductor means to a power source;

a first signal amplifier circuit means having an input terminal and an output terminal, coupled between said first and second conductor means, for amplifying a signal supplied to the input terminal and deriving the amplified signal from the output terminal; and

a succeeding circuit means, coupled to said output terminal of the first signal amplifier circuit means, for preventing a signal voltage due to said parasitic resistances and said amplified signal of the first signal amplifier circuit means from leaking to said input terminal of the first signal amplifier circuit means, said succeeding circuit means including

a second signal amplifier circuit means, connected between said first and second conductor means, for amplifying said amplified signal of the first signal amplifier circuit means into a signal current of a prescribed magnitude, and

a cancellation circuit means, connected between said first and second conductor means, and responsive to the output of said second signal amplifier circuit means, for supplying to said grounding and power supplying conductor means a cancellation current which is substantially equal in magnitude and opposite in phase to said signal current amplified by said second signal amplifier circuit means.

3,969,638

INTEGRATED CIRCUIT BREAKER

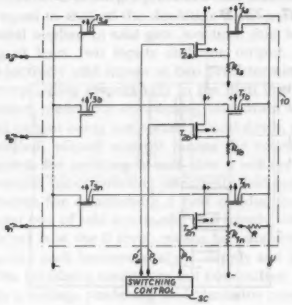
Gianfranco Marchetti, S.Fruttuoso, Milan, and Giovanpietro Bassani, Milan, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jan. 2, 1975, Ser. No. 537,920

Claims priority, application Italy, Jan. 4, 1974, 19073/74

Int. Cl.[2] H03K *17/60, 17/16;* **H04J** *3/10*

U.S. Cl. 307—243 **8 Claims**



4. In a switching system for selectively energizing a load from a plurality of input terminals carrying different signals, in combination:

a plurality of signal paths, one for each input terminal, comprising each a first, a second and a third MOSFET each having a pair of principal electrodes at opposite ends of a channel and a gate capacitively coupled with said channel, the gate of each third MOSFET being connected to the respective input terminal;

a supply of direct current;

conductor means serially connecting the principal electrodes and the channels of the first and third MOSFETs of each signal path across said supply;

an output resistance common to said signal paths in series with the serially interconnected channels of said first and third MOSFETs;

a biasing resistor individual to each signal path connected to the gate of said first MOSFET thereof, the principal electrodes and the channel of said second MOSFET being connected across said supply in series with said biasing resistor; and

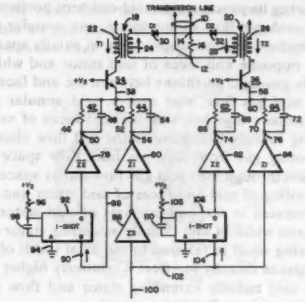
control means connected to the gate of said second MOSFET of each signal path for alternately turning the associated first MOSFET on and off through energization and de-energization, respectively, of said second MOSFET.

3,969,639

TRANSMISSION LINE DRIVER CIRCUIT

Mauritz L. Granberg, Richfield; Howard N. Hanson, Minneapolis; Robert L. Rajala, Blaine, and William G. Whipple, Burnsville, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,336
Int. Cl.² H03K 17/56
U.S. Cl. 307—270 5 Claims



1. A transmission line driver circuit comprising in combination:

a. first and second transformers, each having a primary winding and a secondary winding, said secondary windings of said first and second transformers being connected through unidirectional current conducting means to first and second output terminals and in opposite winding senses with respect to their respective primary windings;

b. a load impedance connected between said first and second output terminals;

c. first and second waveshaping networks;

d. first and second semiconductor current switching means, said first semiconductor current switching means being individually connected between the primary winding of said first transformer and said first waveshaping network and said second semiconductor current switching means being connected between the primary winding of said second transformer and said second waveshaping network; and

e. digital logic circuit means adapted to be connected to a source of digital signals to be transmitted for simultaneously applying signals representative of the true and complementary values of said digital signals individually to said first and second waveshaping networks said digital logic circuit means being coupled to said first and second semiconductor current switching means for causing said first semiconductor current switching means to conduct when said digital signals are of a first binary significance and said second semiconductor current switching means to conduct when said digital signals are of a second binary significance.

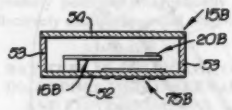
3,969,640

MICRORESONATOR PACKAGING AND TUNING

Juergen H. Staudte, Anaheim, Calif., assignor to Statek Corporation, Orange, Calif.

Division of Ser. No. 237,132, March 22, 1972, Pat. No. 3,766,616. This application Aug. 1, 1973, Ser. No. 384,402
Int. Cl.² H01R 41/04
U.S. Cl. 310—9.1 3 Claims

1. A package containing a microresonator having a tuning fork configuration including a base portion and two tines extending therefrom, said tuning fork configuration having no dimension greater than 500 mils, each of said tines having metal weights thereon, each of said weights having a first region of one thickness and a second region of lesser thickness, at least a portion of said package being transparent to permit the beam from a laser external to said package to pass therethrough for selective removal of portions of said weights to alter the oscillation frequency of said microresonator, removal of material from said first or second regions, respectively, effecting coarse or fine tuning of said microresonator, said package also containing electronic microcircuitry inter-



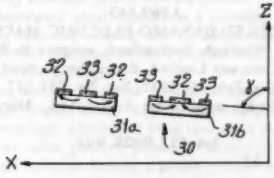
connected to said microresonator, said microcircuitry comprising an oscillator using said microresonator as a frequency source, said package also containing an adjustable capacitor electrically interconnected to affect the frequency of said oscillator, said capacitor including spaced parallel plates, some of said plates being electrically connected within said package and others of said plates being outside of said package, said capacitor utilizing a wall portion of said package as the plate separating dielectric.

3,969,641

QUARTZ CRYSTAL VIBRATOR

Kikuo Oguchi, Shimosuwa; Akio Shimoi, and Toshiaki Ogata, both of Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,462
Claims priority, application Japan, Apr. 16, 1973, 48-42927; May 7, 1973, 48-50440; May 30, 1973, 48-60493
Int. Cl.² H01L 41/18
U.S. Cl. 310—9.5 26 Claims



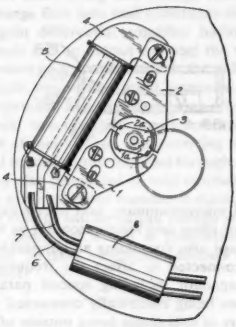
1. A flexural-mode quartz crystal vibrator comprising an X-cut quartz crystal plate having a vibratory portion defined by first and second opposed substantially planar surfaces, a plurality of electrodes disposed on at least one of said surfaces, circuit means coupled to said electrodes for applying signals to said vibrator electrodes to generate electric fields between said electrodes, said electrodes being disposed to direct the major component of said fields substantially parallel to said surfaces in said crystal plate and define a vibrational direction of said vibratory portion parallel with said opposed planar surfaces, said plate having a thickness between said opposed planar surfaces no greater than 0.5 mm, and said plate being formed by rotating an X-cut plate around the X-axis by 0° to 10° and further rotating the plate around the Y'-axis by 70° to 90° or −70° to −90°.

3,969,642

STEP MOTOR FOR ELECTRONIC TIMEPIECE

Masahito Yoshino, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,323
Claims priority, application Japan, July 17, 1973, 48-79835
Int. Cl.² H02K 37/00
U.S. Cl. 310—49 R 1 Claim



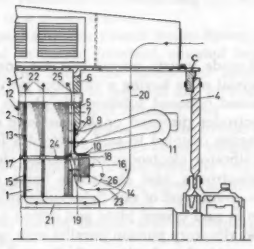
1. In an electronic timepiece, a step motor having a permanent magnet rotor adapted to be stepped through a specific angle, at least two stator poles having semi-circular recessed portions, said recessed portions substantially surrounding said rotor at the periphery thereof, and an electromagnetic core coupled to said stator pole pieces said core including a coil wrapped therearound, said electromagnetic core being adapted in response to each drive pulse applied to said coil to effect first and second magnetic orientations of said stator poles in order to step said rotor through said specific angle, the improvement comprising means coupled to said coil for applying drive pulses thereto to effect said orientations; said drive pulse application means including short circuiting means for terminating said driving pulses applied to said coil at a time not later than the completion of the stepping of the rotor through said specific angle by short circuiting said coil wrapped around said core at a time not later than the terminating of the pulse applied thereto.

3,969,643

GAS-COOLED DYNAMO-ELECTRIC MACHINE

Jorg Säpper, Windisch, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 19, 1975, Ser. No. 551,117
Claims priority, application Switzerland, Mar. 4, 1974, 2996/74
Int. Cl.² H02K 9/00
U.S. Cl. 310—53 7 Claims



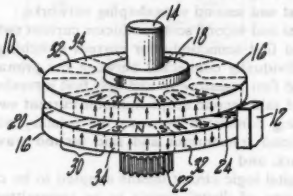
1. A gas-cooled dynamo-electric machine comrising a casing enclosing a rotor component mounted for rotation and which is surrounded by a laminated stator component having a stator winding thereon, means providing a cooling gas flow inlet space within each end portion of said casing between the end wall thereof and the corresponding ends of the rotor and stator components and in which inlet spaces the end turns at opposite ends of said stator winding are located, means for introducing fresh cooling gas into said gas inlet end spaces for flow in a radially inward direction over said end turn portions of said stator winding, means providing a gas flow outlet space between the periphery of said stator component and the surrounding wall portion of said casing, said rotor and stator components being provided with radially extending slots for flow of cooling gas therethrough from each said gas inlet flow space following its passage over said end turn portions of said stator into said gas flow outlet space, and annular gas flow dividing members located respectively in axially spaced relation to the opposite end faces of said stator and which form substantially gas-tight partitions between the end faces of said stator and said gas flow inlet spaces, said annular gas flow dividing members together with the end faces of said stator thus forming radially extending stator end flow channels for flow of cooling gas from said gas inlet flow space radially outward therethrough into said gas flow outlet space thereby to effect cooling of said end faces of said stator and removal of heat generated in the end portions of said stator laminations, the axial width of said radially extending stator end flow channels being small in relation to the axial width of said gas flow inlet spaces thereby to effect a relatively higher gas flow velocity in said radially extending stator end flow channels than exists in said gas flow inlet spaces.

3,969,644

PULSE GENERATOR WITH ASYMMETRICAL MULTI-POLE MAGNET

Walter J. Nowak, Vernon, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Division of Ser. No. 450,562, March 13, 1974, Pat. No. 3,893,059. This application Feb. 3, 1975, Ser. No. 546,259
Int. Cl.² H02K 21/00
U.S. Cl. 310—152 8 Claims



1. An asymmetrical magnet well suited for use in a rotary pulse generator comprising a multi-pole magnetic disc wherein the magnetic poles of the disc consist essentially of a plurality of pole pairs symmetrically spaced about the circumference of the disc with each pole pair including a predominant magnetic pole of one polarity and a subservient magnetic pole of the opposite polarity, the magnetic poles being oriented parallel to the axis of the disc.

3,969,645

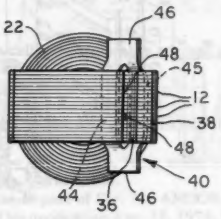
SHADED POLE MOTOR

Willard Spotts, Boonville, and Clifford Brown, Madison, both of Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Continuation of Ser. No. 494,048, Aug. 2, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,353
Int. Cl.² H02K 17/10
U.S. Cl. 310—172 11 Claims

1. In a shaded pole motor having a stator stack formed of annular magnetic laminations defining circumferentially spaced pole projections with respective pole faces which outline a central rotor space, each pole projection having a narrow slot inclined upwardly from corresponding ends of the pole face and forming thereby a pole tip cantilevered toward the pole face, and an electrically conductive continuous loop

shading band having an opening fitting over the pole tip, the improved combination of having each pole tip tapered to the narrowest at the pole face and the shading band having spaced side legs and spaced end heads defining said band opening and the side legs being spaced apart across the opening a distance less than the thickness of the pole tip thereby necessitating a wedging interference fit thereof particularly along an exposed edge contact area crosswise to the stack against the pole tip upon complete positioning of the band on the pole tip and the end heads being spaced apart across the opening a distance significantly more than the thickness of the stack to leave a discernible air gap under the shading band at each endmost stack lamination even upon complete positioning of the band



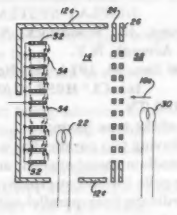
on the pole tip, and epoxy coating selectively on the pole projections and shading band and specifically bridging over said edge contact area and further specifically over each endmost lamination and under the shading band at each endmost stack lamination in the location of the air gap and thereby independently covering the shading band and stack at the air gap and effectively thereby electrically insulating the band and the stack, field coil means wound on each pole projection over the epoxy coating and, wherein the end heads project beyond the endmost stack laminations distances comparable to the breadth of the field coil means on the pole projection, serving thereby to mechanically hold the former in place.

3,969,646

ELECTRON-BOMBARDMENT ION SOURCE INCLUDING SEGMENTED ANODE OF ELECTRICALLY CONDUCTIVE, MAGNETIC MATERIAL

Paul D. Reader, and Harold R. Kaufman, both of Fort Collins, Colo., assignors to Ion Tech, Inc., Fort Collins, Colo.

Filed Feb. 10, 1975, Ser. No. 548,763
Int. Cl.² H01J *1/50;* **H05H** *1/00*
U.S. Cl. 313—359 **13 Claims**



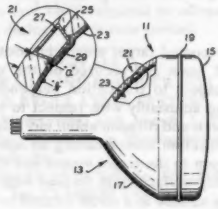
1. In an electron-bombardment ion source which includes:
means defining a chamber for containing an ionizable propellant;
means for introducing said propellant within said chamber;
an anode disposed within said chamber;
an electron-emissive cathode disposed within said chamber;
means for impressing a potential between said anode and said cathode to effect electron emission at a sufficient velocity to ionize said propellant;
means for accelerating ions out of said chamber;
and means for establishing a magnetic field within said chamber to increase the efficiency of ionization of said propellant by said electrons;
the improvement comprising:
a plurality of successively-spaced segments of electrically conductive magnetic material distributed within said chamber;
means for interconnecting said segments with said impressing means so that said segments collectively constitute said anode,
and individually adjacent ones of said segments respectively being oppositely polarized magnetically with said segments collectively establishing said magnetic field.

3,969,647

CATHODE RAY TUBE ELECTRICAL CONNECTIVE TRAVERSAL INCORPORATING INTERNAL SHIELDING AND CONTACT MEANS

Allan W. Keen, Waterloo, and Joseph B. Shinal, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 419,768, Nov. 28, 1973, abandoned.
This application Feb. 10, 1975, Ser. No. 548,268
Int. Cl.² H01J *29/00, 31/00*
U.S. Cl. 313—477 HC **2 Claims**



1. In a cathode ray tube wherein an electrical conductive coating interiorly disposed on at least a portion of the wall of the encompassing envelope makes substantial contact with the planar bottom surface of an electrical connective traversal positioned in the wall of said envelope and exposed to the interior of said envelope, an improvement therein in the form of structural contact and shielding means disposed integral to the interiorly oriented planar bottom surface of said traversal to effect increased areal contact in a plurality of areas with said priorly disposed coating and to additionally provide regional radiation shielding of the traversal area, said improvement means comprising:
a resilient metallic member formed to have a configurated expanse related to the shaping of the internal contour of said envelope whereof at least two areal portions of said member make positive pressured contact with said coating, said member having a planar central area formed in a manner compatible with the planar bottom surface of said traversal, the expanse of said member being configurated to superjacently cover said traversal region; and
bonding attachment means to effect a contiguous planar seated jointure between said member and said traversal whereby the planar central portion of said member is securely affixed to a bare central area of the planar bottom surface of said traversal to provide positive seating contact with the coating thereat and peripherally spatially therefrom.

3,969,648

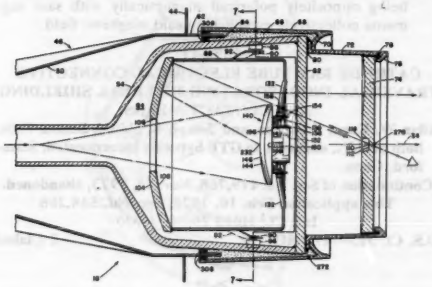
PROJECTION TELEVISION TUBE SYSTEM

George R. Hergenrother, Watertown, and Henry E. Kloss, Cambridge, both of Mass., assignors to Advent Corporation, Cambridge, Mass.

Filed Sept. 3, 1974, Ser. No. 502,768
Int. Cl.² H01J *31/00, 29/89*
U.S. Cl. 313—482 **8 Claims**

1. A projection television tube having, in combination,
an envelope with means to seal it to define an evacuated space,

a mounting barrel having supports engaging the envelope to secure the barrel fixedly against translation along and rotation about a barrel axis in said barrel and resiliently with respect to thermal expansion radially of said axis, said mounting barrel having a spider and a barrel portion with an accurately formed edge at one end thereof, said edge being circular with its center lying in said barrel axis, means in the envelope to project an electron beam through the barrel portion,



phosphor coated target means in position for illumination by said beam and secured on the spider nonadjustably with respect to translation perpendicular to the barrel axis and adjustably with respect to translation along the barrel axis and rotation about any axis transverse thereto, and a projection mirror having an aperture for passage of said beam to the target means and a segmental spherical reflecting surface, said formed edge contacting said reflecting surface at a circle located inwardly of its periphery.

3,969,649

CIRCUIT ARRANGEMENT FOR BICYCLE LIGHTING SYSTEMS

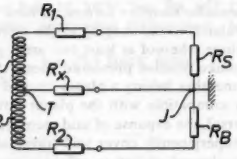
Walter Emil Wilhelm Jacob, Hagvretsstigen 7, 141 44 Huddinge, Sweden

Filed Oct. 15, 1974, Ser. No. 515,053

Claims priority, application Sweden, Oct. 15, 1973, 7313999

Int. Cl.² B60Q *1/00*

U.S. Cl. 315—78 **7 Claims**



1. A circuit arrangement for bicycle lighting systems and the like, comprising:

a dynamo having a winding provided with a tap dividing the winding into two parts;

a front lamp connected to a first of said winding parts;

a rear lamp connected to the second winding part, said lamps being interconnected by a junction point;

an impedance connected between the tap and the lamp junction point and of preselected value;

the number of turns and the resistance of said first winding part and the number of turns and resistance of said second winding part being such as to establish system equilibrium, wherein the potential of the tap is the same as the potential of the lamp junction point, during normal operation conditions with lamp resistances varying.

3,969,650

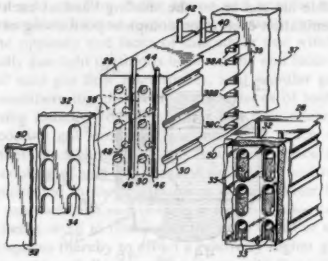
GAS DISCHARGE DISPLAY DEVICE AND A NOVEL HOLLOW CATHODE THEREFOR

Gerald Joseph Chodil, Highland Park; Michael C. DeJule, Chicago, both of Ill., and David Glaser, Greenbrook, N.J., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,569

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **29 Claims**



1. In a gas discharge panel having an array of rows and columns of gas discharge cells which emit light when a discharge is created in a gas atmosphere between a forwardly located anode; that is, an anode lying toward the front panel display and a rearwardly mounted cathode structure, the improvement wherein said cathode is a scannable hollow cathode structure made up of two electrically isolated parts comprising:

a set of row-wise extending, electrically conductive, rear cathode means, one for each row of cells, and with each row of the series communicating with every cell in its respective row of cells; and

a corresponding set of electrically conductive, row-wise extending forward cathode means, one for each rear cathode means, each forward cathode means being positioned adjacent and essentially parallel to its respective rear cathode means and situated between said rear cathode means and the anode such that all pairs of the rear and forward cathode means together operate as hollow cathodes which may be scanned row by row by the application of scanning signals thereto.

3,969,651

DISPLAY SYSTEM

James C. Greeson, Jr., Woodstock, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,818

Int. Cl.² H05B *41/00*

U.S. Cl. 315—169 TV **1 Claim**

1. A display of the type having

an envelope having two parallel flat walls and containing an ionizable medium therebetween, and

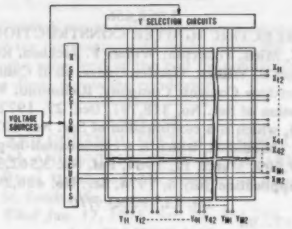
light emitting cells formed at crossover points of sets of X and Y coordinate lines parallel with said walls, wherein the improvement comprises,

pairs of conductors supported on said flat walls and extending positioned to define said coordinate lines, the two conductors of each pair being conductively isolated from each other,

means connecting said conductors to be energized for write and erase operations in a pattern in which both conductors of a selected coordinate line are energized and only one of the two conductors of an unselected line is energized,

said conductors of a pair being spaced apart on said walls to form a single cell at a point of crossover with conduc-

tors of the other coordinate set, said conductors of a pair being capacitively coupled such that the ionizable medium of a cell experiences the average voltage of the pair of conductors.

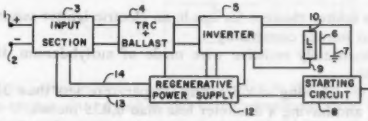


3,969,652

ELECTRONIC BALLAST FOR GASEOUS DISCHARGE LAMPS

Rollie R. Herzog, Burnt Hills, N.Y., assignor to General Electric Company, Carmel, Ind.

Continuation-in-part of Ser. No. 430,830, Jan. 4, 1974, abandoned. This application Apr. 15, 1975, Ser. No. 568,175
Int. Cl.² H05B *41/29, 41/36;* G05F *1/30*
U.S. Cl. 315—224 **32 Claims**



1. A circuit for operating at least one gaseous discharge lamp comprising:
input means for connecting the circuit to a source of DC electrical power;
switch means connected to said input means, said switch means having a control electrode;
sensing means connected to said switch means for sensing the current through said switch means;
feedback regulation means connected to said sensing means and to said control electrode of said switch means for controlling the conduction of said switch means;
energy storage means connected in a circuit relationship with said switch means for providing lamp operating current for a predetermined time while said switch means is turned off;
said switch means and said energy storage means providing ballasting for the lamp;
an inverter circuit connected in a circuit relation with said switch means;
said inverter circuit being adapted to be connected to the lamp for providing operating voltage for the lamp.

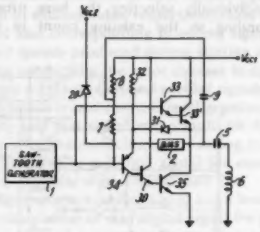
3,969,653

DEFLECTION CIRCUIT FOR TELEVISION RECEIVER SET OR THE LIKE

Hirokazu Fukaya, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,098
Claims priority, application Japan, Dec. 28, 1973, 49-494
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—403 **7 Claims**

1. A deflection circuit comprising;
a power source for providing a first voltage;
a saw-tooth wave source means for generating a saw-tooth wave signal having a blanking signal at retrace periods;
a power amplifier including a transistor amplifier and a load therefor connected in series with said transistor amplifier, said power amplifier being connected to amplify said saw-tooth wave signal from said saw-tooth wave source;
means for turning off said transistor amplifier in response to said blanking signal;
a deflection coil connected to receive current supplied from said power amplifier,



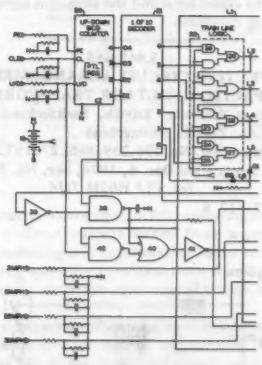
means for producing a second voltage; and
switching means connected between the input terminal of said transistor amplifier and said means for producing a second voltage, said switching means causing said transistor amplifier to turn on in response to current from said deflection coil during said retrace period.

3,969,654

PROPULSION TRAIN LINE ENCODER FOR A TRAIN SPEED REGULATION SYSTEM

Reed H. Grundy, Murrysville, and Joseph J. Pierro, Pittsburgh, both of Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

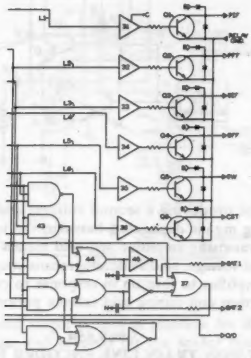
Filed May 27, 1975, Ser. No. 581,224
Int. Cl.² H02P *7/00*
U.S. Cl. 317—5 **5 Claims**



1. A propulsion train line encoder, for use in a speed regulation system for a train comprised of cars having individual propulsion apparatus operable to a plurality of levels of propulsion effort, said system including advance train line apparatus for varying the train propulsion effort in car by car steps from any base level, comprising in combination,
a. a reversible binary counter means coupled for receiving a periodic clock pulse from the associated advance train line apparatus, when each cycle of car by car propulsion variation is completed, and a count direction signal from the speed regulation system having a first or a second condition in accordance with the direction of the existing error between actual and allowed train speeds,
1. said counter means operable for counting said clock pulses, adding or subtracting each pulse from the existing digital count as said direction signal has a first or second condition, respectively,

b. propulsion train line driver means responsive to a selective input signal for actuating the propulsion apparatus on each car to a selected level to establish a base propulsion effort for that train,

c. conversion logic means connected for receiving the digital output count from said counter means and coupled to said train line driver means for supplying a converted signal individually selecting the base propulsion level corresponding to the existing count in said counter means,



d. an inhibit logic network coupled to said conversion logic means, to said counter means, and to receive said direction signal, and responsive to an output signal from said conversion means representing either the maximum or minimum count limit for generating a signal to inhibit further counting operation when said counter means counts to either limit and the direction signal has a corresponding condition.

3,969,655

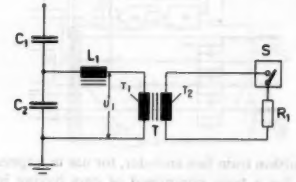
PROTECTIVE CIRCUIT ARRANGEMENT FOR CAPACITOR VOLTAGE TRANSFORMERS

Georges-Albert Gertsch, Zurich, Switzerland, assignor to Micafil A.G., Zurich, Switzerland

Continuation of Ser. No. 336,239, Feb. 27, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,425

Int. Cl.² H02H 7/16

U.S. Cl. 317—12 A **19 Claims**



1. A capacitor voltage transformer system comprising a capacitor voltage divider constituted by a plurality of capacitor sections connected in series between a high voltage source and ground, an intermediate voltage transformer including a primary winding connected across a section of said capacitive voltage divider through a principal inductive reactance, a secondary winding, a damping load having a value which is a multiple of the rated burden of said transformer, normally open switching means for connecting said damping load to said secondary winding, and means constituted by an auxiliary inductive reactance connected in series with said capacitor voltage divider for closing said switching means when the voltage drop across said auxiliary inductive reactance reaches a predetermined value in the event of a breakdown of the voltage at the terminals of the primary winding of said transformer.

3,969,656

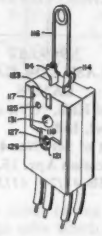
ELECTRIC IGNITER CONSTRUCTION

Richard K. Mitts, Fullerton; Wilbur F. Jackson, Rolling Hills, and James R. Willson, Garden Grove, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 318,791, Dec. 27, 1972, Pat. No. 3,823,345, which is a continuation of Ser. No. 107,767, Jan. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 807,509, March 17, 1969, Pat. No. 3,562,590. This application July 8, 1974, Ser. No. 486,294

Int. Cl.² F23Q 7/10

U.S. Cl. 317—98 **2 Claims**



1. An igniter element for use in an electric igniter assembly for a gas burner comprising

an electrically resistive wire made of molybdenum disilicide,

said wire having an operating temperature less than 2500° F. and having a diameter less than 0.035 inches,

said wire having terminal ends and an intermediate portion therebetween,

electrical lead means connecting said terminal ends to a source of electrical power,

said intermediate portion of said wire being coiled into substantially one and one-half loops, and

overlapping portions of said loops being spaced from each other by a distance in the range of 0.018 inches to 0.035 inches.

3,969,657

MAGNETIZING AND DEMAGNETIZING ELECTRICAL CIRCUIT

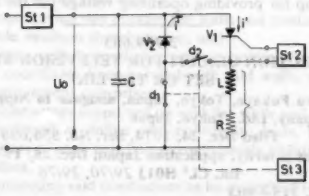
Dieter Oettinghaus, Hohenlimburg, Germany, assignor to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany

Filed Feb. 6, 1975, Ser. No. 547,395

Claims priority, application Germany, Oct. 4, 1974, 2447363

Int. Cl.³ H01F 13/00

U.S. Cl. 317—157.5 PM **2 Claims**



1. A circuit arrangement for magnetizing and demagnetizing permanent magnets comprising:

a condenser;

means for charging the condenser;

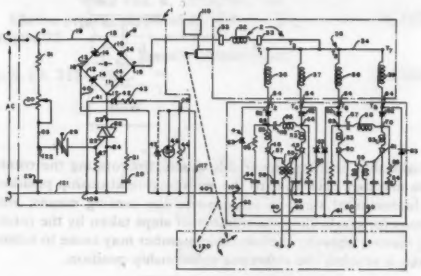
a magnetizing and demagnetizing coil;
electronic switch means joined to the coil for selectively connecting said coil across the condenser;
a diode;
additional switch means selectively connected to one end of the coil for connecting said diode across the condenser and to the other end of the coil for connecting the coil and the diode across the condenser.

3,969,658

MOTOR AND CONTROL SYSTEM HAVING CYCLIC REVERSAL AND UNIDIRECTIONAL CAPABILITIES

John S. C. Htsui, Hazelwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 17, 1975, Ser. No. 541,798
Int. Cl.² H02P 1/40
U.S. Cl. 318—202 **35 Claims**



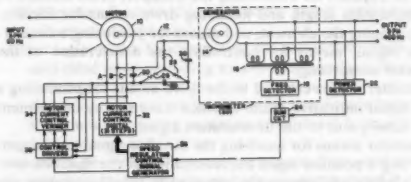
1. In a device having a member driven in at least two operation modes, one of said modes being a constant cyclic reversal movement occuring at some predetermined interval of rotational movement of said member, and the other of said modes being a continuous rotation of said member in a preselected direction, the improvement which comprises dynamoelectric system means for driving said member in each of said operational modes, said dynamoelectric system means comprising a motor including a rotating member and a stationary member, means for supplying electrical energy to the said motor, said energy supplying means including a pair of input terminals, a rectifier bridge having a negative DC terminal, said rectifier bridge being electrically connected to said input terminal pair, said energy supply means providing a first output and a second output, said first output being variable to permit selective variation of motor speed, said second output being substantially constant, said negative terminal providing a common connection point for both said first output and said second output.

3,969,659

ALTERNATING CURRENT MOTOR SYSTEM

Herbert W. Thode, Oradell, N.J., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed Dec. 16, 1974, Ser. No. 533,044
Int. Cl.² H02P 7/62
U.S. Cl. 318—237 **28 Claims**



1. A system for controlling the speed of an A.C. electric motor having a wound rotor comprising

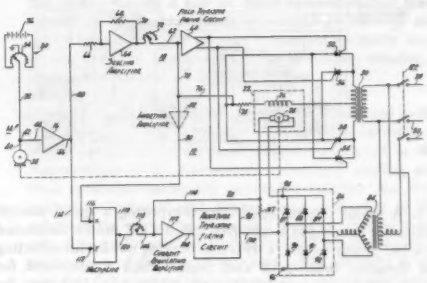
a. means responsive to the speed of said motor for providing an output signal which deviates from a certain value correspondingly with deviations in the speed of said motor from a given speed,
b. control signal generator means responsive to said output signal for providing first and second control signals, corresponding to deviations of said output signal of larger value and of smaller value respectively, said second control signal also corresponding to output signal values for low motor speeds produced during starting and the like,
c. means for controlling the rotor current in said motor in accordance with said first and second signals, and
d. means included in said control signal generator means for converting said first signal into a multi-bit digital signal, said converting means including an analog to digital converter responsive to said first signal for converting said first signal into said digital signal, and
e. means responsive to said first signal and a level representing the analog value of said digital signal for providing as said second signal a signal corresponding to the difference therebetween.

3,969,660

REGENERATIVE MOTOR CONTROL WITH IMPROVED CIRCUIT MEANS

Arnold Ruppert, Cambridge (Galt), Canada, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Aug. 2, 1974, Ser. No. 494,228
Int. Cl.² H02P 5/04
U.S. Cl. 318—338 **17 Claims**



1. A regenerative motor control for regulating the operative condition of a direct current motor from a power source between the motoring and regenerative states in accordance with a bi-polarity operative condition error signal produced by a motor operative condition error signal source, said control comprising:
a field circuit means having an input couplable to said error signal source and an output connectable to the field winding of the motor, said field circuit means being responsive to said error signal for providing current energization in either direction from the power source through the motor field winding and for reversing the current energization from a first direction through zero to a second direction during a transient period initiated by a reversal of the polarity of the error signal;
signal means connected to said field circuit means for providing a signal proportional in magnitude to the magnitude of the motor field winding current energization and having a polarity indicative of the direction of said energization;
an armature circuit means having an output connectable to the armature winding of the motor for energizing the armature winding from the power source responsive to the magnitude of a controlling signal of a preselected polarity applied to an input thereof, the energization of the armature winding providing motoring operation to the motor for one direction of field winding current ener-

gization and providing regenerative operation to the motor, for the motoring direction of motor rotation, for the other direction of field winding current energization; and

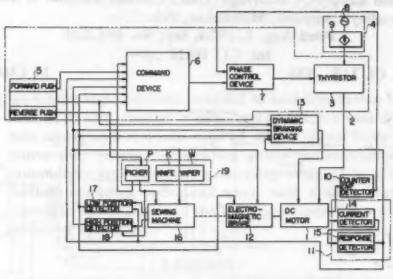
analog signal generating means mathematically combining the magnitude and polarity characteristics of input signals applied to at least a pair of inputs for determining the magnitude and polarity characteristics of a resultant output signal provided at an output of said means, one of said inputs being couplable to said error signal source, the other of said inputs being coupled to said signal means for receiving said field winding current energization signal, sid output being coupled to the input of said armature circuit means for providing a controlling signal to said armature circuit means having the preselected polarity during the motoring and regenerative states of the motor.

3,969,661

MOTOR CONTROL APPARATUS

Shigeki Morinaga; Kazuo Onishi, and Tadashi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 19, 1974, Ser. No. 498,663
Claims priority, application Japan, Aug. 20, 1973, 48-92511
Int. Cl.² H02P *3/12*
U.S. Cl. 318—375 **4 Claims**



1. A motor control apparatus comprising a speed control device for running at a specified speed a DC motor connected to a DC power supply, a dynamic braking device for effecting the dynamic braking of said motor when a command for decelerating said motor is issued, a low speed detector for generating a detection signal when the magnitude of the braking current due to the dynamic braking of said motor is reduced below a predetermined set point, and means for maintaining a predetermined low speed level of said motor by controlling said speed control device, said means terminating said dynamic braking upon the actuation of said low speed detector, said low speed detector including a current detector which is transferred from a first output state to a second output state when the dynamic braking current of said DC motor detected by said low speed detector is increased beyond a first set point, said current detector being transferred from said second output state to said first output state when said dynamic braking current is reduced below the predetermined set point which is a second set point having a magnitude less than that of said first set point; and a response detector for generating an output signal when said current detector is transferred from said second output state to said first output state.

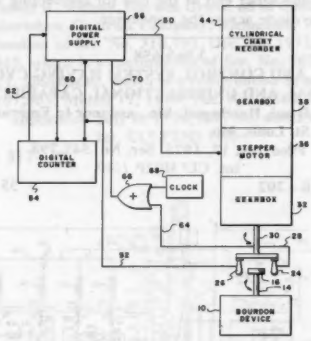
3,969,662

MEASURING THE ANGULAR POSITION OF A SHAFT

Leroy E. Weaver, Houston, Tex., assignor to Sperry-Sun, Inc., Sugar Land, Tex.

Filed Nov. 8, 1973, Ser. No. 414,061
Int. Cl.² G05D *16/00*
U.S. Cl. 318—645 **22 Claims**

1. In a borehole-pressure recorder, apparatus for measuring the rotation of a shaft about its longitudinal axis, said rotation corresponding to borehole pressure levels, comprising: a centrally rotatable member spaced from the shaft; means for sensing relative rotation between the rotatable member and the shaft from a reference relationship position to limit relationship positions that are angularly spaced from the reference



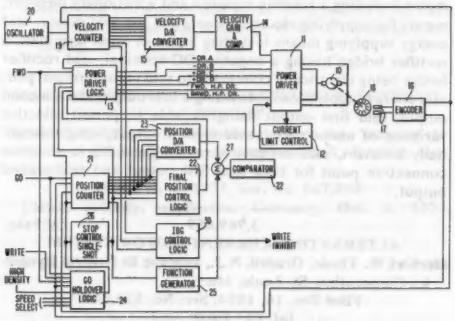
relationship position; reversible means for rotating the rotatable member back toward the reference relationship position in incremental steps in response to the sensing means; and means for controlling the number of steps taken by the rotating means, whereby the rotatable member may cease to rotate when it reaches the reference relationship position.

3,969,663

CAPSTAN CONTROL FOR A TAPE DRIVE SYSTEM

William C. Arthur, and William W. Steger, both of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 17, 1974, Ser. No. 515,601
Int. Cl.² H02P *1/04*
U.S. Cl. 318—561 **17 Claims**



1. In a system for controlling the transport of an element of indeterminate length and including drive means for frictionally engaging the element, and means for producing a deceleration signal, means for controlling the deceleration of the element comprising:

encoder means coupled to the drive means for producing a signal indicative of the distance traversed by the element subsequent to the deceleration signal;

decoder means for receiving the distance signal and outputting a position signal representative of the distance traveled by said element subsequent to the deceleration signal;

a function generator energizable in response to said deceleration signal for producing a reference signal representa-

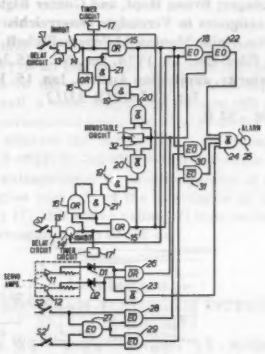
tive of a desired position-versus-time characteristic;
signal combining means coupled to said decoder means and said function generator for receiving said position signal and said reference signal and outputting an error signal representative of difference therebetween; and
a power circuit coupled to said signal combining means for energizing the drive means in response to said error signal to cause a fixed length of the element to be transported subsequent to the occurrence of the deceleration signal.

3,969,664

MONITOR SYSTEMS

Michael Camilleri, Chatham; Michael Terence Usher, Bedford, and Mark Beresford Wilson, Houghton-le-Spring, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 4, 1974, Ser. No. 512,170
Claims priority, application United Kingdom, Oct. 18, 1973, 48604/73
Int. Cl.² G05B *23/02*
U.S. Cl. 318—565 **17 Claims**



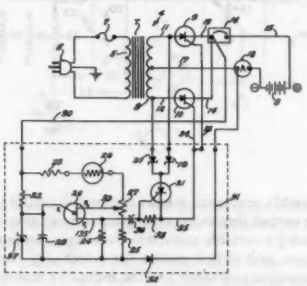
1. A monitor apparatus arranged for monitoring the operation of remote control apparatus for actuators, which monitor apparatus is separate and electrically isolated from the remote control apparatus, comprising:
first means for providing respective inputs representative of directional input commands to the control apparatus;
first logic means electrically connected to and actuable by said first means for producing a signal;
second means for providing respective inputs representative of servo directional output control signals from the control apparatus;
second logic means for comparing the respective inputs from said second input providing means with the signal from said first logic means to provide an error signal upon the detection of an error between the respective inputs from said second input providing means and the signal from said first logic means;
third means for providing respective inputs representative of actuator response;
third logic means for comparing the respective inputs from said third input providing means with the signal from said first logic means to provide an error signal upon the detection of an error in the respective inputs from said third input providing means and the signal from said first logic means; and
fourth logic means for receiving signals from said second and third logic means to provide an output signal if either of the signals from said second and third logic means is an error signal.

3,969,665

AUTOMATIC CONTROL CIRCUIT FOR BATTERY CHARGING SYSTEMS

Clifford A. Rowas, Cincinnati, Ohio, assignor to Schauer Manufacturing Corporation, Cincinnati, Ohio

Filed Dec. 23, 1974, Ser. No. 535,992
Int. Cl.² H02J *7/04*
U.S. Cl. 320—35 **2 Claims**



1. A storage battery charging system comprising:
a transformer having a primary winding connected at its ends to a source of alternating current, and a secondary winding having output leads,
a first full wave rectifier means connected to the output leads of the secondary winding; said first full wave rectifier means having a pair of direct current output leads connected to the terminals of a storage battery, and which includes a pair of gate controlled rectifiers each interposed in an output lead of the secondary winding,
a unijunction relaxation oscillator circuit,
a pilot controlled rectifier,
a second full wave rectified control circuit connected to the output leads of the secondary winding and consisting of a pair of diodes having their anodes connected to the output leads of the transformer secondary winding and their cathodes electrically connected together, the connected cathodes of said diodes being connected to the anode of the pilot gate controlled rectifier, and the cathode of said pilot gate controlled rectifier being connected to the gates of the pair of gate controlled rectifiers in the said first full wave rectifier means, said unijunction relaxation oscillator circuit being connected across the output terminals of the first full wave rectifier and having a voltage output conduction capacitance coupled to the gate of the pilot gate controlled rectifier, said oscillator circuit including a thermistor in series with a potentiometer and adapted to sense the battery voltage and trigger the pilot gate controlled rectifier when said voltage is or decays below a predetermined full charge, said gate controlled rectifier triggering the pair of gate controlled rectifiers to initiate and maintain the battery charging control of the system and also render the pilot gate controlled rectifier non-conductive to turn off the pair of gate controlled rectifiers when the battery has attained a predetermined charge.

3,969,666

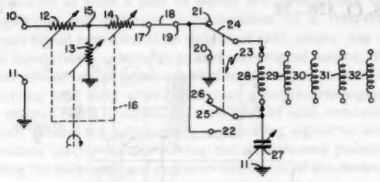
UNIVERSAL IMPEDANCE TEST LOAD

Louis W. Simon, Fort Mitchell, Ky., assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 166,712, July 28, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 317,945
Int. Cl.² G01R *1/20*
U.S. Cl. 323—74 **5 Claims**

1. A universal test load apparatus having independently adjustable reflection coefficient magnitude and angle as seen from a pair of input terminals comprising:

1. a variable attenuator coupled to both of the input terminals and having a pair of output terminals, means for varying the attenuation of said attenuator while maintaining a substantially constant characteristic impedance between both said input and output terminals; and



2. variable reactance means connected across said attenuator output terminals, said variable reactance means comprising a variable capacitive reactance, an inductive reactance, and switch means for selectively connecting the capacitive reactance and the inductive reactance in series with each other or in parallel with each other, the series or parallel connections being selected dependent on said reflection coefficient angle.

3,969,667

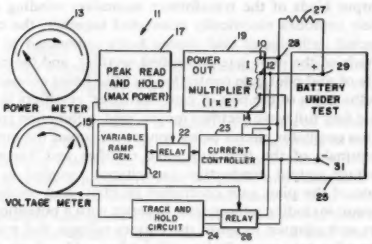
DEVICE FOR DETERMINING THE STATE OF CHARGE IN BATTERIES

Gerald E. McWilliams, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 283,141, Aug. 23, 1972, abandoned. This application Dec. 20, 1974, Ser. No. 534,990

Int. Cl.² G01N *27/42*

U.S. Cl. 324—29.5 **2 Claims**



1. A device for determining the state of charge in an electrochemical system said system comprising in combination:

a. power measuring means connected to said electrochemical system having an output voltage proportional to the power output of said electrochemical system,

b. peak read and hold circuit means connected to said power measuring means and providing a first output that is proportional to the output voltage of said power measuring means and a second output that is proportional to the error signal of said peak read and hold circuit,

c. power indicating means connected to the first output of said peak read and hold circuit means,

d. a current control means coupled to said electrochemical system for controlling the current flow from said electrochemical system to increase in a linear manner;

e. a means for generating a ramp function signal coupled to said current control means for controlling said current control means in a linear manner.

f. track and hold circuit means coupled to said electrochemical system for providing an output voltage proportional to the output voltage of said electrochemical system,

g. voltage indicating means connected to the output of said track and hold circuit means,

h. first control means coupled between said current control means and said ramp function signal generating means and having an input connected to said second output of said peak read and hold circuit means for disconnecting said ramp function signal generating means from said current control means in response to a predetermined value of said error signal,

i. second control means coupled between said track and hold circuit means and said electrochemical system and having an input connected to said second output of said peak read and hold circuit means for disconnecting said track and hold circuit means for said electrochemical system in response to said predetermined value of said error signal.

3,969,668

METHOD FOR CHECKING THE PLANARITY OF A COLD-ROLLED FERROMAGNETIC STRIP

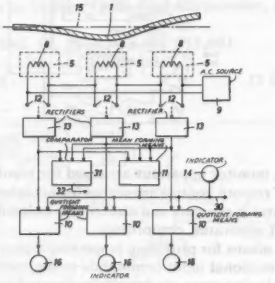
Hans Weinzinger; Bruno Hopf, and Gunter Rigler, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 23, 1974, Ser. No. 535,363

Claims priority, application Austria, Jan. 15, 1974, 289/74

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 R **6 Claims**

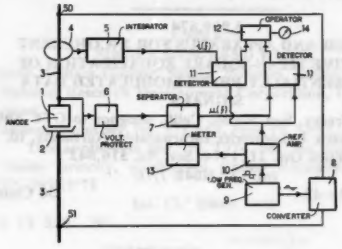


1. A method of checking the planarity of a cold-rolled ferromagnetic strip, which comprises pulling the strip in its longitudinal direction over two parallel supports which extend transversely to and are spaced apart in said longitudinal direction, subjecting said strip between said supports to magnetic forces which are approximately at right angles to the surface of said strip and are exerted by a plurality of solenoids distributed across and clear of the strip and which comprise exciter windings fed with a predetermined alternating current, whereby a local deflection is produced in the strip adjacent each of said solenoids, which deflections differ in a non-planar strip, in which the tensile stress differs across the strip, sensing the voltage across each of said exciter windings during an interval of time which is shorter than one-half of a period of said voltage and which includes a crossover of said alternating current, and deriving the values which are related to said local deflections from the voltages across the exciter windings of said solenoids.

3,969,669
METHOD AND APPARATUS FOR CONTINUOUSLY DETERMINING THE INTERNAL RESISTANCE OF AN ELECTROLYSIS CELL

Thierry Brault, St.-Michel-de-Maurienne, and Jean-Claude Lacroix, Chambery, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed May 7, 1975, Ser. No. 575,479
Claims priority, application France, June 5, 1974, 74.19297
Int. Cl.² G01R *27/02*
U.S. Cl. 324—65 R **12 Claims**

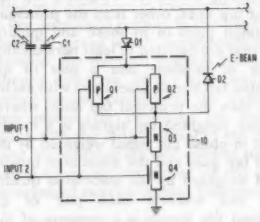


1. A method for continuously determining the internal resistance (R) of an electrolysis cell from the voltage (U) at the terminals of the cell and from the current (I) flowing through the cell, a weak alternating current (if) of frequency (f) being superimposed upon the direct current (I) used for electrolysis, wherein the active part (rf) of the impedance which the cell offers to this alternating current is determined, followed by extrapolation to zero frequency of the function giving the active part (rf) of the impedance as a function of the frequency (f), this active value (rf) thus inclining towards the internal resistance (R) of the cell.

3,969,670
ELECTRON BEAM TESTING OF INTEGRATED CIRCUITS

Leon Li-Heng Wu, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,991
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 PC **7 Claims**



1. In an integrated circuit structure including a plurality of functional circuits, each having at least one input and at least one output, the method of testing each said circuits comprising the steps of:

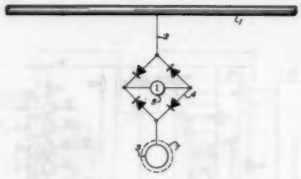
connecting one side of each one of a plurality of capacitive means to an input of each said circuit;

connecting the other side of said plurality of capacitive means to a desired logic potential level; and selectively applying an electron beam to desired ones of said capacitive means, thereby generating electron-hole pairs rendering said capacitive means resistively conductive.

3,969,671
CHARGING CURRENT VOLTMETER

David A. Smith, Rte. 1, Box 707, Willcox, Ariz. 85643

Continuation-in-part of Ser. No. 271,909, July 14, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,646
Int. Cl.² G01R *19/22, 1/20*
U.S. Cl. 324—119 **9 Claims**



1. A single probe voltmeter for providing an indication of the voltage potential of a high tension transmission line, said voltmeter comprising:

a. a single probe electrically contactable to the line under test for conveying a flow of current from the line;

b. a spherical capacitance means electrically connected to the line through said single probe;

c. a rectifier network electrically disposed intermediate said single probe and said spherical capacitance means for rectifying the current flowing through said single probe to said spherical capacitance means; and

d. an ammeter electrically disposed across said rectifier network, said ammeter being responsive to the current flowing through said rectifier network to charge said spherical capacitance means;

e. said ammeter being effective to provide an indication of the charging current which is reflective of the voltage potential of the line;

f. said spherical capacitance means being effective to cause the voltmeter to be essentially immune to variations due to electrostatic fields in the vicinity of high tension transmission lines.

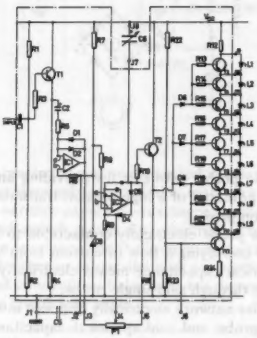
3,969,672
VOLTAGE LEVEL INDICATOR ESTABLISHED BY A SERIES OF PROGRESSIVELY ENERGIZED LIGHT EMITTING DIODES

Gunnar Wallander, Bandhagen, and Bernt Bostrom, Hagersten, both of Sweden, assignors to Audio Stockholm, Stockholm, Sweden

Filed Feb. 7, 1975, Ser. No. 548,017
Int. Cl.² G01R *19/16*
U.S. Cl. 324—133 **4 Claims**

1. A voltage level detector comprising a plurality of light emitting means connected electrically in series, a constant current source coupled to said series-connected light emitting means, a voltage supply source connected to the series connection of said light emitting means and said constant current source, a plurality of voltage level controlled means correlated respectively with said light emitting means, each said voltage level controlled means having two main electrodes and one control electrode, the main electrodes of each of said voltage level controlled means being connected electrically in parallel with a corresponding one of said light emitting means and the control electrode thereof being connected to means for providing a control voltage common to all of said voltage level controlled means and which varies with the level of the voltage to be detected, each of said voltage level controlled means in the series being operable sequentially in accordance with a different level of the voltage to be detected to change over from a conducting to a non-conducting state and vice versa whereby each of said voltage level controlled means when in a conducting state functions as a by-pass for current flow around its corresponding light emitting means and when in a

non-conducting state functions to force current flow through its corresponding light emitting means, said voltage level controlled means being arranged electrically in groups in one to three means and wherein with respect to each said group individual resistors are connected respectively between a common connection point for the group and the control electrode of a corresponding voltage level controlled means of the



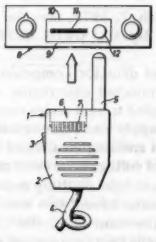
group, and wherein diodes are respectively connected between the output of said control voltage providing means and the common connection point for a corresponding group, each of said diodes being forward biased when at least one of the voltage level controlled means of the corresponding group is conducting and back biased when none of the voltage level controlled means of that particular group is conducting.

3,969,673

PERSONAL RADIO STATION

Karl Gustav Gösta Lennart Nordlöf, Skarholmen, Sweden, assignor to AB Teleplan, Solna, Sweden

Filed Oct. 19, 1973, Ser. No. 407,819
Int. Cl.² H01B 1/38
U.S. Cl. 325—16 **8 Claims**



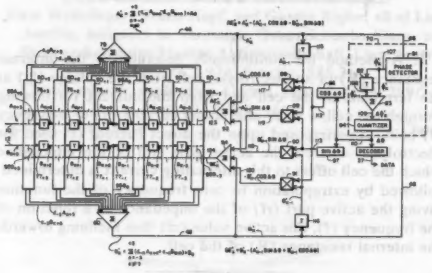
1. In a personal radio system having a portable set composed of first housing means containing a transmitting unit and a receiver unit, and a remote control unit for controlling a plurality of different functional operations of the system, the system also including an external auxiliary control unit arranged to be permanently mounted in a support structure, the improvement wherein said remote control unit comprises: a second housing means of a size so as to be capable of being hand held; a flexible cable extending between said first and second housing means to connect said remote control unit to said transmitting and receiver units; an aerial connected to said second housing means and projecting therefrom; and function control means for controlling the different functions of said system, said remote control unit includes contact means mounted within said second housing means and coupled to said function control means, and said auxiliary control unit includes mating contact means for selectively coupling the receiver and transmitter units to said external auxiliary control unit for enabling the different functions of the radio system to be controlled by said external auxiliary control unit, whereby said contact means and said aerial on said second housing means form a plug-in unit for coupling the portable set to said external auxiliary control unit.

3,969,674

METHOD AND APPARATUS FOR INCOHERENT ADAPTIVE MEAN-SQUARE EQUALIZATION OF DIFFERENTIALLY PHASE-MODULATED DATA SIGNALS

Robert J. Tracey, San Mateo, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 21, 1974, Ser. No. 516,842
Int. Cl.² H04B 1/10
U.S. Cl. 325—42 **30 Claims**



1. An adaptive equalizer for a phase-modulated data transmission channel causing distorted signals, comprising:

delay line means receiving distorted signals and having pairs of output tap lines at synchronously equally spaced intervals that are determined by the transmission rate of data symbols traversing the channel, associated tap lines of each pair passing in-phase and quadrature-phase tap signals, one of said pair of tap lines being principal tap lines for passing principal tap signals;

first weighting means for weighting tap signals from each pair of tap lines, other than the principal tap lines, with associated pairs of in-phase and quadrature-phase tap gains that are updated at least periodically for producting a pair of in-phase and a pair of quadrature-phase weighted tap signals associated with each pair of tap lines other than the principal tap lines, wherein each pair of in-phase weighted tap signals is a measure of the associated in-phase tap signal weighted by the associated in-phase tap gain and the associated quadrature-phase tap signal weighted by the associated quadrature-phase tap gain, and wherein each pair of quadrature-phase weighted tap signals is a measure of the associated in-phase tap signal weighted by the associated quadrature-phase tap gain and the associated quadrature-phase tap signal weighted by the associated in-phase tap gain;

second weighting means for weighting the principal tap signals with constants;

first combining means combining all of the in-phase and quadrature-phase weighted tap signals, including the weighted principal tap signals, for producing an equalized signal;

error signal producing means responsive to the output of said first combining means for producing, during at least some symbol intervals, common in-phase and quadrature-phase components of an error signal that is a measure of

the difference between the signal vector equalized during one symbol interval and a reference vector which is the signal vector equalized during the prior symbol interval after the latter equalized signal vector is rotated by a phase angle that is proportional to a quantized value of the difference between the phases of the signals equalized during the one and the prior symbol intervals; and

correlation means responsive to tap signals from pairs of tap lines other than the principal tap lines and to the in-phase and quadrature-phase error signals for producing updated values of the in-phase and quadrature-phase tap gains.

3,969,675

SINGLE SIDE-BAND RADIO

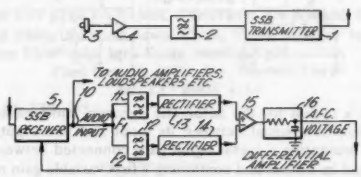
Harold William Gosling, Sketty, Swansea, Wales, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 371,469, June 19, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,329

Claims priority, application United Kingdom, June 20, 1972, 28783/72

Int. Cl.² H04B 1/68

U.S. Cl. 325—50 **22 Claims**



3. Single side-band information-transmission apparatus including filter means for substantially attenuating signals extending over a predetermined portion of the frequency range of input signals to be transmitted, said portion not extending to either frequency extremes of said range, means for modulating a signal in accordance with the output signal from the filter means to provide a single side-band signal and for transmitting the said single side-band signal, a receiver having demodulation means for demodulating the received signal to provide output signals dependent on the received signals and on a control signal applied to the receiver, frequency-sensitive means for detecting any departure in frequency from a nominal position of a low amplitude portion in the band of signals from the demodulation means which corresponds to the said predetermined portion, the nominal position being the position in the frequency spectrum, of the said predetermined portion, and control means, coupled to the output of the frequency-sensitive means, for providing the said control signal in accordance with the output signal of the frequency-sensitive means and for applying the said control signal to the receiver, said control signal not depending on any signal present in said predetermined portion of said frequency range.

3,969,676

ELECTRON BEAM IONIZATION SIGNAL SAMPLER

Conrad Driussi, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 406,059, Oct. 12, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 568,965

Int. Cl.² G11C 11/26; H03K 5/00

U.S. Cl. 328—121 **1 Claim**

1. An electronic signal sampler for fully sampling each pulse received by the sampler, comprising:

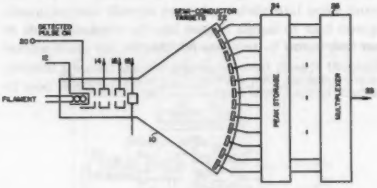
an input for receiving said pulses,

a cathode ray tube envelope having a face and an electron beam,

means coupled to said input for controlling the intensity of the electron beam in response to the electrical pulse received,

means for deflecting said beam such that the beam traces a scan on the face of the envelope,

a plurality of electron sensitive semi-conductors spaced along the inner surface of the face of the envelope, each



for detecting at least a part of the beam and providing an output responsive to the intensity of the part detected,

peak storage means coupled to said electron sensitive semi-conductors for separately storing the electrical charges corresponding to the amount of current generated by the respective semi-conductor for each pule, and

a multiplexer coupled to said peak storage means for systematically processing all of the charges stored for each pulse and providing the sampler output.

such that all parts of each pulse are sampled.

3,969,677

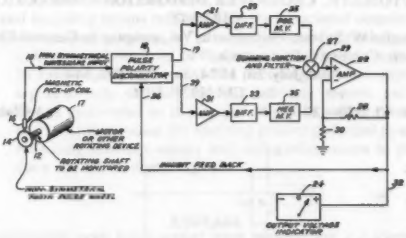
FREQUENCY RESPONSIVE POLARITY DISCRIMINATOR

Joseph T. Woyton, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Division of Ser. No. 438,232, Jan. 31, 1974, Pat. No. 3,916,326. This application May 21, 1975, Ser. No. 579,407

Int. Cl.² H03K 5/156, 9/06

U.S. Cl. 328—140 **5 Claims**

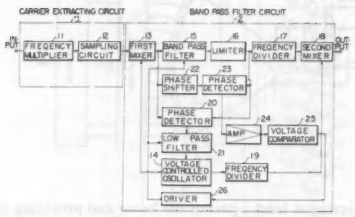


1. A sensing circuit comprising a means for producing a bi-polar, non-symmetrical waveshape signal, a polarity discriminator connected to said means, a signal processing circuit having a positive and negative responding channel means which includes an amplifier, a monostable multivibrator connected in series, and a summing junction connected to said channel means, said circuit being connected to said processing discriminator and controlled by the frequency of said signal, and a feedback means connecting said summing junctions output to said polarity discriminator for selecting one polarity component of said signal input, while rejecting the opposite polarity component.

3,969,678
BAND PASS FILTER CIRCUIT WITH AUTOMATIC BANDWIDTH ADJUST

Masaru Asahara, Kawasaki; Noriyasu Toyonaga; Hiroaki Ohyama, both of Tokyo; Hiroshi Nakamura, Sagamihara, and Ryushiro Yoshizawa, Yokohama, all of Japan, assignors to Fujitsu Ltd., Japan

Filed July 3, 1975, Ser. No. 593,126
Claims priority, application Japan, July 8, 1974, 49-78059
Int. Cl.² H03G 5/22
U.S. Cl. 328—167 **5 Claims**

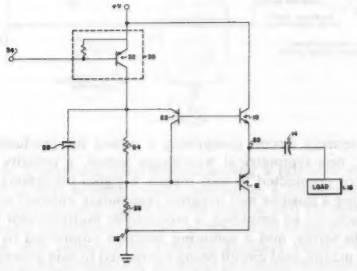


1. A band pass filter circuit including a band pass filter, a first phase detector which detects phase differences between an input and an output of said band pass filter, a low pass filter which receives an output of said first phase detector, a voltage controlled oscillator which is controlled by an output of said low pass filter, first and second mixers which are respectively connected to the input side and the output side of said band pass filter and receive an output of said voltage controlled oscillator, so that an input signal frequency of said band pass filter is pulled into the center frequency of said band pass filter, said band pass filter circuit comprising means for providing a first signal to change a bandwidth of said band pass filter from a wide bandwidth to a narrow bandwidth and a second signal occurring simultaneously to change a cutoff frequency of said low pass filter from a higher frequency to a lower frequency when said input signal frequency is pulled into said center frequency of said band pass filter.

3,969,679
AUTOMATIC CROSSOVER DISTORTION CORRECTION CIRCUIT

Charles W. Sexton, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed July 26, 1974, Ser. No. 492,344
Int. Cl.² H03F 3/04
U.S. Cl. 330—22 **3 Claims**



1. In a television receiver vertical sweep output circuit, a complementary symmetry amplifier comprising:

first and second transistors interconnected in a complementary symmetry manner to create a common output for supplying load current in response to an input signal applied to said first and second transistors,

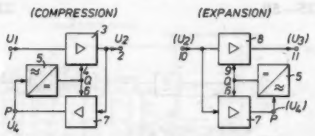
means for generating a bias voltage including filter means responsive to said input signal for eliminating crossover distortion effects from said load current, and

control means connected across said filter means and responsive to the bias current drawn by said first and second transistors to regulate said bias voltage as a function of said bias current.

3,969,680
AUTOMATIC DYNAMIC COMPANDER SYSTEM

Jürgen Wermuth, Stederdorf, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jan. 24, 1975, Ser. No. 543,931
Claims priority, application Germany, Jan. 26, 1974, 2403799; Feb. 9, 1974, 2406258
Int. Cl.² H03G 7/00
U.S. Cl. 330—29 **9 Claims**



1. In a circuit for the automatic dynamic compression or expansion of a signal between its input and its output, the circuit presenting a useful signal path connected between its input and its output and containing a first variable gain member which is electronically controllable for varying the transmission factor between the circuit input and output, the circuit also presenting a branch path connected at one point to the useful signal path and containing a control voltage generator for generating, from the signal at such point in the useful signal path, a control voltage and means applying the control voltage to the variable gain member, for causing the transmission factor of the useful signal path to have a value dependent on the value of the control voltage, the improvement comprising: a second variable gain member connected in said branch path and arranged to be electronically controllable for varying the transmission factor exhibited by said branch path; and means connecting the output of said control voltage generator to said second variable gain member for effecting a counter-regulation of the transmission factor of said branch path, relative to the transmission factor variation imparted to said useful signal path.

3,969,681
FAST ELECTRONIC TUNING OF HIGH POWER CIRCUITS FOR VHF-UHF POWER AMPLIFIER AT HIGH-EFFICIENCY

George Fincke, W. Allenhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,788
Int. Cl.² H03F 3/60
U.S. Cl. 330—56 **1 Claim**

1. A selectively tunable output circuit for an ultra-high frequency power amplifying device comprising:

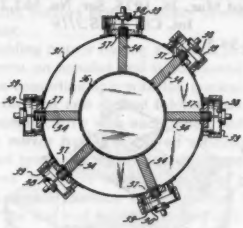
a tunable, coaxial, TEM mode cavity having cylindrical center and outer conductors;

a triode amplifying device located within said center conductor of said tunable coaxial cavity, said triode having its grid connected to said outer conductor and its anode connected to said center conductor;

at least six radially disposed, unequally spaced selectively positioned conductive tuning rods, capacitance coupled

to said center conductor and insulated from and extending outward through said cylindrical outer conductor;

a PIN diode at the outer end of each of said radial conductive rods, each diode arranged to short said radial rod to



said outer conductor when said diodes are biased into the conductive state; and

means to selectively bias said diodes to thereby change the tuning of said device.

3,969,682

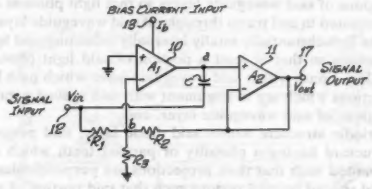
CIRCUIT FOR DYNAMIC CONTROL OF PHASE SHIFT

David Philip Rossum, Santa Clara, Calif., assignor to Oberheim Electronics Inc., Santa Monica, Calif.

Filed Oct. 21, 1974, Ser. No. 516,744

Int. Cl.² H03F 1/34

U.S. Cl. 330—85 **7 Claims**



5. A circuit for dynamic control of phase shift of a signal between input and output terminals thereof comprising a variable transconductance amplifier having a differential input stage with separate inverting and noninverting input terminals, and a current source output stage, said noninverting input terminal being connected to circuit ground, a capacitor connected in series between said circuit input terminal and the output of said transconductance amplifier, impedance matching means for coupling the output of said amplifier to said circuit output terminal comprised of a noninverting buffer amplifier having high input impedance, means for coupling negative feedback from the output of said transconductance amplifier to the input thereof comprised of a direct current path between said circuit output terminal and said inverting input terminal of said transconductance amplifier, and means for supplying a variable control bias current to said amplifier for a phase shift of said signal translated by said circuit from said input terminal to said output terminal.

3,969,683

AUTOMATIC LEVEL CONTROL CIRCUIT

Wayne Nixon Fabricius, Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 21, 1975, Ser. No. 569,810

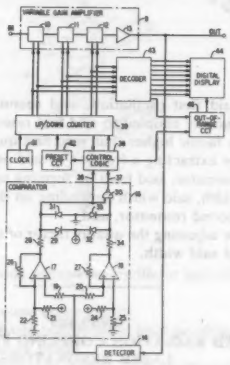
Int. Cl.² H03G 3/20

U.S. Cl. 330—144 **7 Claims**

1. An automatic signal level control circuit comprising:

amplifying means connected to receive an input signal and having variable gain that changes in precisely defined discrete increments to provide an output signal whose magnitude is variable independent of the level of the input signal,

comparing means having an upper predetermined limit and a lower predetermined limit for evaluating the amplitude of said output signal, said comparing means having feedback means to provide hysteresis in its transfer characteristic, and said comparing means producing an output signal indicative of the amplitude of said output signal relative to said limits as the hysteresis in the transfer characteristic therein provides substantial noise immunity in the indication of said output signal of said comparing means from the significant amount of noise that may be present on said output signal when it passes through one of said limits,



digital means for controlling the gain of said amplifying means comprising logic means and up/down counting means, said logic means responsive to the output of said comparing means, said counting means being enabled and inhibited by said logic means, and said counting means having counting states and associated outputs that control the gain of said amplifying means to maintain its output between said limits,

and decoding means responsive to the associated outputs of said counting means for providing a set of digital signals indicative of the level of the input signal being received by said amplifying means, said decoding means comprising read-only memory means, inverting means, gating means connected to the output of said counting means, and switching means for applying ground potential to said read-only memory means and said gating means to produce the set of digital signals.

3,969,684

METHOD FOR REDUCING THE WIDTH OF A LASER PULSE AND A CORRESPONDING DOUBLE-RESONATOR LASER

Olivier de Witte, Gif-sur-Yvette; Armand Eranian, Bois Colombes, and Pierre Dezauzier, Talence, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Jan. 7, 1974, Ser. No. 431,315

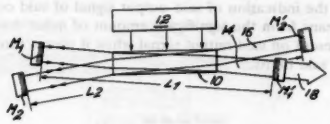
Claims priority, application France, Jan. 12, 1973, 73.01111

Int. Cl.² H01S 3/08, 3/081, 3/10

U.S. Cl. 331—94.5 C **21 Claims**

5. A laser which emits a light pulse of adjustable width, comprising:

an amplifying medium having a stimulable transition,
pulsed pumping means for exciting said medium,
a first resonator including two mirrors spaced at a distance of L_1, for containing said medium and for sustaining a first oscillation on said transition, said first resonator having a first quality factor,
a second resonator, including two mirrors spaced at a distance of L_2, for containing said medium and for sustaining a second oscillation on said transition, in competition



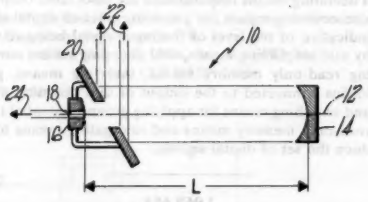
with said first oscillation, said second resonator being continuously coupled to said first resonator and having a quality factor higher than said first quality factor,
means for extracting a fraction of said oscillation from said first resonator, said fraction forming said pulse of adjustable width, said width depending on the quality factor of said second resonator, and
means for adjusting the quality factor of said second resonator and said width.

3,969,685

ENHANCED RADIATION COUPLING FROM UNSTABLE LASER RESONATORS

Peter P. Chenausky, West Hartford, and Robert J. Freiberg, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1974, Ser. No. 530,456
Int. Cl.² H01S 3/081
U.S. Cl. 331—94.5 C **11 Claims**



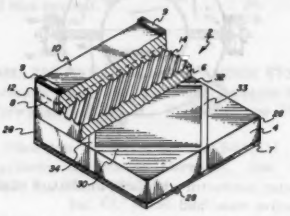
1. A method of coupling laser radiation from an unstable resonator having a centerline axis and operating in a low order mode pattern which is positioned about the axis including the steps of:
coupling out of the resonator as a principal output beam, all the laser radiation resonating in a region which extends along and includes the centerline axis; and
coupling laser radiation out of the resonator from a region not including the axis as a separate secondary output beam.

3,969,686

BEAM COLLIMATION USING MULTIPLE COUPLED ELEMENTS

Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 562,279
Int. Cl.² H01S 3/19
U.S. Cl. 331—94.5 H **9 Claims**

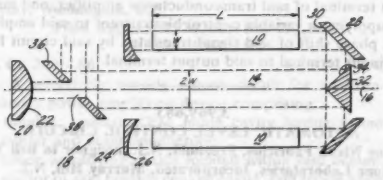


1. A heterojunction diode laser comprising:
a light waveguide layer of semiconductor material, said waveguide layer being sandwiched between first and second adjacent layers of semiconductor material with at least one of said adjacent layers being of a different material than the material of said waveguide layer, one of said adjacent layers being of a different conductivity type than the conductivity type of said waveguide layer such that a PN junction is formed therebetween,
means for electrically pumping at least two spaced parallel regions of said waveguide layers so that light photons are generated in and travel throughout said waveguide layer,
means for substantially totally internally reflecting said light photons so that at least a portion of said light photons follow a path within said waveguide layer which path has sections which are in alignment with said spaced parallel regions of said waveguide layer, and
a periodic structure within said diode laser, said periodic structure having a plurality of parallel teeth which are oriented such that their projections are perpendicular to said spaced parallel regions such that said portion of said light photons will be reinforced in a coherent manner thereby providing the feedback necessary to produce two parallel output light beams.

3,969,687

STANDING WAVE UNSTABLE RESONATORS FOR RADIAL FLOW LASERS

Robert J. Freiberg, South Windsor, and George H. McLafferty, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 14, 1975, Ser. No. 568,084
Int. Cl.² H01S 3/081
U.S. Cl. 331—94.5 C **11 Claims**

1. A radial flow laser system having an unstable resonator with a centerline axis and a standing wave optical path and including:

a first end mirror having a circular reflective surface which is positioned on and symmetrically about the centerline axis;

a first folding mirror having a conical reflective surface which is positioned on and symmetrically about the centerline axis with the reflective surfaces of the first end and first folding mirrors being optically communicative with each other;

a second folding mirror having a conical reflective surface which forms an annulus and is positioned symmetrically about the centerline axis with the conical reflective surfaces of the first and second folding mirrors being optically communicative with each other; and

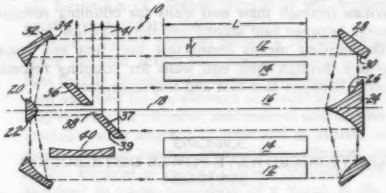
an annular mirror having a curved reflective surface and positioned symmetrically about the centerline axis with the curved reflective surface optically communicative with the conical surface of the second folding mirror whereby the first end mirror, the first and second folding mirrors and the annular mirror form a standing wave unstable resonator.

3,969,688

TRAVELING WAVE UNSTABLE RESONATORS FOR RADIAL FLOW LASERS

Robert J. Freiberg, South Windsor, and George H. McLafferty, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 14, 1975, Ser. No. 568,082
Int. Cl.² H01S 3/081
U.S. Cl. 331—94.5 C **7 Claims**



1. A radial flow laser system having an unstable ring resonator with a traveling wave optical path and including:

a first axial mirror having a conical reflective surface which is positioned on and symmetrical about an axis forming the centerline of the resonator;

a second axial mirror having a conical reflective surface which is positioned on and symmetrically about the centerline axis with the apex of the first axial mirror pointed toward the apex of the second axial mirror;

a first annular mirror having a conical reflective surface and positioned symmetrically about the centerline axis with the apex end of the first annular mirror disposed oppositely with respect to the apex of the second axial mirror and with the reflective surfaces of the second axial and first annular mirrors being optically communicative with each other; and

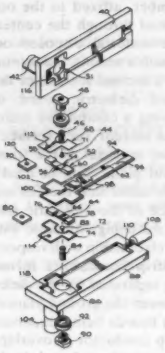
a second annular mirror having a conical reflective surface and positioned symmetrically about the centerline axis with the apex end of the second annular mirror disposed oppositely with respect to the apex of the first axial mirror and with the reflective surface of the second annular mirror being optically communicative with the reflective surfaces of both of the first axial and first annular mirrors whereby the first and second axial mirrors and the first and second annular mirrors form an unstable, traveling wave, ring resonator.

3,969,689

DUAL DIODE OSCILLATOR AND AIRSTRIP TRANSMISSION LINE APPARATUS

Bill E. Corrons, Montclair, and James F. Barker, Twenty Nine Palms, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Apr. 7, 1975, Ser. No. 565,488
Int. Cl.² H03B 7/14
U.S. Cl. 331—107 R **10 Claims**



1. A multiple-diode microwave oscillator including, in combination:

a plurality of ground plane plates;

a plurality of airstrip transmission lines positioned between said ground plane plates;

a plurality of avalanche diodes each positioned in a strap cavity having unbiased conductive walls and coupled to a wall of the cavity and to a respective one of said plurality of transmission lines;

means for coupling operating signals to each of said plurality of avalanche diodes; and

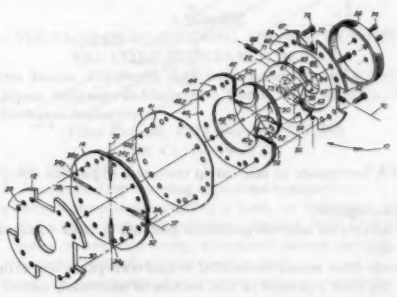
means for combining the power from each of said diodes at the same desired frequency and phase.

3,969,690

RADIO FREQUENCY SWITCH

Russell W. Hansen, Stoughton, and Matthew Fassett, Billerica, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1975, Ser. No. 554,851
Int. Cl.² H01P 1/10
U.S. Cl. 333—7 R **1 Claim**



1. A radio frequency switch for coupling selected ones of a plurality of ports comprising:

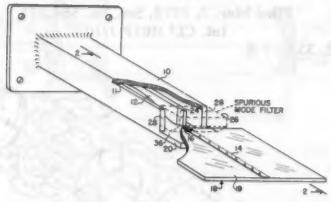
a. an outer frame;
b. a first dielectric board, affixed to such outer frame, having a ground plane on one side thereof and a plurality of strip conductors formed on the other side thereof to extend radially inwardly of such board, one end of each one of the plurality of strip conductors being coupled to a corresponding one of the plurality of ports, such ports being disposed about the periphery of such dielectric board;
c. a dielectric sheet having a first surface disposed over the plurality of strip conductors;
d. a frame member, affixed to the outer frame, having an aperture formed through the center portion thereof and a conductive material disposed on one of the planar surfaces thereof, a second planar surface thereof being in contact with a second surface of the dielectric sheet;
e. a disk-shaped dielectric board, disposed within such aperture, having a conductive material disposed on one planar surface thereof, such surface being in a plane with the conductive material of the frame member to form a second ground plane, and at least one strip conductor formed on the other side thereof and in contact with the second surface of the dielectric sheet, such disk-shaped dielectric board being rotatable within the aperture and in a parallel relationship with respect to the first dielectric board, the strip conductors formed on the dielectric boards being separated by the dielectric sheet and being disposed between the ground planes, the strip conductors on both such boards being dimensioned to enable the at least one strip conductor to overlap pairs of the plurality of strip conductors by a length in the order of $\lambda/4$ where λ is the effective wavelength of the nominal operating frequency of the switch, thereby to effectuate a coupling between selected pairs of the plurality of strip conductors; and
f. detent means for indicating such coupling, such detent means including an engageable pair of elements, one of such pair of elements being affixed to the outer frame and the other one of such pair of elements being affixed to the disk-shaped dielectric board.

3,969,691

MILLIMETER WAVEGUIDE TO MICROSTRIP TRANSITION

David L. Saul, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 11, 1975, Ser. No. 586,113
Int. Cl.² H01P 1/16
U.S. Cl. 333—21 R **4 Claims**



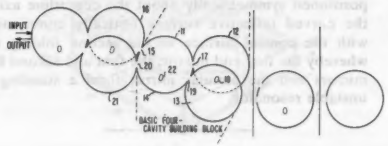
1. A waveguide to microstrip transition apparatus comprising:
a waveguide;
a section of microstrip circuit coupled to said waveguide; and
mode filter means connected to said waveguide and extending over a portion of said section of microstrip circuit for preventing spurious modes of propagation beyond said waveguide, said mode filter means comprising a partially enclosed conductive cavity having an opening facing said portion of said section of microstrip circuit, said opening extending over said section of microstrip circuit.

3,969,692

GENERALIZED WAVEGUIDE BANDPASS FILTERS

Albert Edward Williams, Bethesda, and Ali Ezzeldin Atia, Gaithersburg, both of Md., assignors to Communications Satellite Corporation (Comsat), Washington, D.C.

Filed Sept. 24, 1975, Ser. No. 616,479
Int. Cl.² H01P 7/06, 1/20
U.S. Cl. 333—73 W **6 Claims**



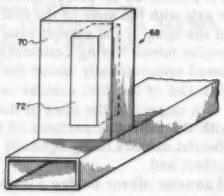
1. A generalized TE_{011} mode waveguide filter comprising:
at least first, second, third and fourth cylindrical cavities, each of said cavities being tuned to resonate in the TE_{011} mode at a common center frequency,
first coupling means connecting said first and second cavities through their side walls for coupling resonant energy between said first and second cavities,
second coupling means connecting said third and fourth cavities through their side walls for coupling resonant energy between said third and fourth cavities,
third coupling means connecting said second and third cavities through their end walls for coupling resonant energy between said second and third cavities, and
fourth coupling means connecting said first and fourth cavities through their end walls for coupling resonant energy between said first and fourth cavities.

3,969,693

PASSIVE MICROWAVE POWER DISTRIBUTION SYSTEMS

John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 482,946, June 25, 1974, Pat. No. 3,953,853. This application Apr. 25, 1975, Ser. No. 571,670
Int. Cl.² H01P 1/10, 1/18, 1/32, 5/12
U.S. Cl. 333—98 S **1 Claim**



1. In combination with a waveguide, a lateral stub that is an odd number of quarter-wavelengths long for reflecting energy arriving from either direction in the waveguide, and a ferrite latching phase shifter mounted in said stub that is approximately transparent to microwave energy in one latched state and is operable to change the electrical length of the stub substantially by 90° in another latched state.

3,969,694

ELECTRIC FUSE FOR ELEVATED CIRCUIT VOLTAGES CAPABLE OF INTERRUPTING SMALL OVERLOAD CURRENTS

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed June 11, 1975, Ser. No. 585,961
Int. Cl.[2] H01H 85/12
U.S. Cl. 337—161 4 Claims

1. An electric fuse adapted to form multibreaks at the occurrence of small protracted overload currents including

a. a tubular casing of electric insulating material;

b. a pulverulent arc-quenching filler inside said casing;

c. a pair of metallic terminal elements closing the ends of said casing;

d. a first fusible element having a relatively small resistance and forming a plurality of serially related points of reduced cross-sectional area conductively interconnecting said pair of terminal elements, said first fusible element having means at a predetermined point thereof for causing formation of a break therein at the occurrence of small protracted overload currents;

e. a second fusible element having a relatively high resistance shunted across said predetermined point of said first fusible element and having ends immediately adjacent said first fusible element conductively connected to said first fusible element, said ends of said second fusible element being adapted to melt and to initiate arcing at points thereof located immediately adjacent said first fusible element at smaller current intensities than those required to cause formation of a break in the center region of said second fusible element; and

f. blocks of metal spaced from said first fusible element arranged in the zone of arcing established by fusion of said ends of said second fusible element to increase the contamination of said zone of arcing by products of arcing resulting from vaporization of said blocks of metal to accelerate formation of series breaks in said first fusible element.

3,969,695

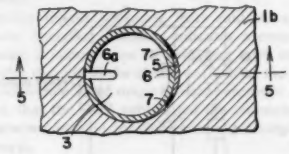
ELECTRIC FUSE AND TERMINAL PLUG THEREFOR

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Aug. 6, 1975, Ser. No. 602,319
Int. Cl.[2] H01H 85/16
U.S. Cl. 337—236 8 Claims

1. An electric fuse including a tubular casing of electric insulating material, a granular arc-quenching filler inside said casing, fusible element means inside said casing embedded in said filler, and a pair of plug terminals closing the ends of said casing and conductively interconnected by said fusible element means wherein the improvement comprises in that

a. the axially inner end surfaces of said pair of plug terminals are provided with blind bores engaged by the axially outer ends of said fusible element means and also engaged by spring means tending to clamp said axially outer ends of said fusible element means against the lateral walls of said blind bores; and in that



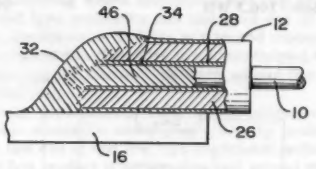
b. soft solder joints are formed inside said blind bores conductively connecting the axially outer ends of said fusible element means to said pair of plug terminals.

3,969,696

REFRACTORY RESISTOR WITH SUPPORTING TERMINAL

Denis G. Wolfe, Santa Ana; Richard K. Mitts, Fullerton, both of Calif.; Wilbur F. Jackson, deceased, late of Rolling Hills, Calif., and by Linda A. Benton, trust administrator, Long Beach, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 19, 1973, Ser. No. 398,889
Int. Cl. H01c 1/14
U.S. Cl. 338—315 21 Claims



1. A resistance and terminal comprising

an elongated resistance element made from a conductive refractory material which is weakened where subjected to a substantial temperature gradient,

a metal supporting member extending along a segment of the element from one end of the element and at least partially surrounding the segment of the element,

a fused portion having constituents of the supporting member metal and the refractory material joining the one end of the resistance element to the supporting member, and

said supporting member having an unfused portion along a substantial portion of the segment providing mechanical support for the element where subject to weakening.

3,969,697

VOLTAGE DROP WARNING APPARATUS WITH NEGATIVE-RESISTANCE DEVICE

Hitoo Iwasa, Takatsuki, and Gota Kano, Nagaoka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

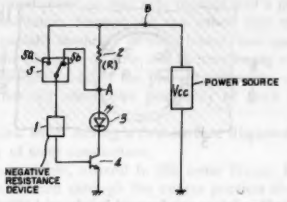
Filed Dec. 30, 1974, Ser. No. 537,392
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—248 B 4 Claims

1. A voltage-drop warning apparatus comprising:

a series connection including a load, an indication means and a semiconductor switching element, both ends of the series connection being connected across positive and negative ends of a power source, and

a negative-resistance device comprising a complementary connection of an n-channel field-effect transistor and a p-channel field-effect transistor, one end of the negative-

resistance device being connected to a junction point between said load and the switching element, and the



other end of said device being connected to a control-signal input-terminal of the switching element.

3,969,698

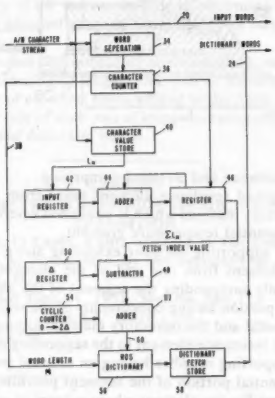
CLUSTER STORAGE APPARATUS FOR POST PROCESSING ERROR CORRECTION OF A CHARACTER RECOGNITION MACHINE

Ellen Willis Bollinger, Poughkeepsie, N.Y.; Anne Marie Chaires, Lanham, Md.; Jean Marie Ciconte, Rockville, Md.; Allen Harold Ett, Bethesda, Md.; John Joseph Hilliard, Potomac, Md.; Donald Francis Kocher, and Walter Steven Rosenbaum, both of Silver Spring, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1974, Ser. No. 513,202

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 WD **10 Claims**



1. A cluster storage apparatus for outputting groups of valid alpha words as potential candidates for the correct form of an alpha word misrecognized by an OCR machine, comprising:

a two-dimenational array of alpha word read only storage locations, each location having a group of alpha words arranged such that adjacent locations contain alpha words having similar OCR misread propensities;

means for assigning numeric values to the characters of the input alpha word based upon the read reliability of the characters;

a first-dimensional accessing means for addressing said locations based upon the values assigned to the characters of which the input alpha word is composed;

a second-dimensional accessing means for accessing said locations based upon the number of characters in said input alpha word;

said first-dimensional accessing means calculating the first-dimensional address as a magnitude

$$Y = \sum_{N=1}^{M} L_N$$

where L_N is the numeric value assigned to each alpha character;

whereby an input alpha word which is potentially in error can be associated with that portion of the read only storage which contains potential candidates for the correct form of the input alpha word.

3,969,699

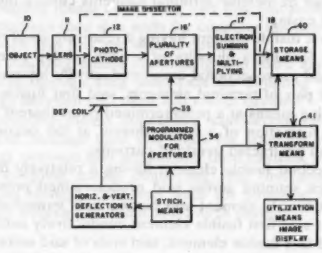
IMAGE DISSECTOR WITH MANY APERTURES FOR HADAMARD ENCODING

Laurence D. McGlaughlin, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 11, 9175, Ser. No. 567,154

Int. Cl.² H01J *39/12*

U.S. Cl. 340—146.3 F **3 Claims**



1. An improved image dissector camera tube system comprising:

photocathode means for generating an electron image;

a plurality of normally operative detector means at known adjacent positions of the electron image for producing signals indicative of the electron density at each of the known adjacent positions;

electron controlling means for causing one of a plurality of predetermined patterns of said plurality of detector means to be inoperative during each of a plurality of successive image sampling periods, said electron controlling means further comprising programmed modulator means connected in controlling relation to each of said detector means;

combining means for combining the signals from the operative detector means during each of the plurality of sampling periods to produce a combined signal for each of said plurality of periods, said programmed modulator means together with said combining means being so coded as to cause the electron image to be transformed to a Hadamard image; and

transform means for transforming the combined signals into a series of electrical signals indicative of the electron image.

3,969,700

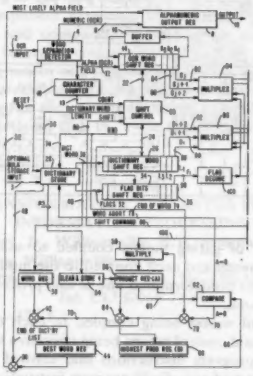
REGIONAL CONTEXT MAXIMUM LIKELIHOOD ERROR CORRECTION FOR OCR, KEYBOARD, AND THE LIKE

Ellen Willis Bollinger, Poughkeepsie, N.Y.; Anne Marie Chaires, Lanham, Md.; Jean Marie Ciconte, Rockville, Md.; Allen Harold Ett, Bethesda, Md.; John Joseph Hilliard, Potomac, Md., and Walter Steven Rosenbaum, Silver Spring, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 459,820, April 10, 1974, abandoned. This application July 30, 1975, Ser. No. 600,743

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 WD **38 Claims**



1. A data processing system for selecting the correct form of an input error word garbled by an OCR splitting error, the correct form of the error word being a member of a predetermined class of reference words, each comprising a plurality of characters, comprising:

a storage means for storing said predetermined class of reference words, selected characters composing the reference words having stored in said storage means an error propensity indicium for indicating the propensity of the character to being misread through a splitting error,

said storage means storing a first type conditional probability that a first character can be output by said OCR through character substitution, given that a second character was actually scanned, and a second type conditional probability that a pair of adjacent characters can be output by said OCR through character splitting, given that a third character was actually scanned;

a first register means connected to an input line for storing the characters of said error word arranged in the sequence of receipt from said OCR, with a first character at a given end of said error word defining a first position for an error word origin;

a second register means connected to said storage means for storing the characters of a first reference word from said predetermined class in said storage means, arranged in a sequence to correspond with said sequence of characters in said first register means, with a first character in said reference word corresponding to said first character in said error word, defining a first position for a reference word origin;

decoding means connected to said second register for decoding the error propensity indicium corresponding to the character located at said reference word origin in said reference word;

accessing means connected to said storage means for accessing from said storage means, when said decoded indicium indicates a character splitting propensity, a first one of said first type conditional probability that given the character located at said reference word origin in said reference word was scanned, that the OCR substituted the character located at said error word origin in said error word;

said accessing means accessing from said storage means when said decoded indicium indicates a error splitting propensity, a second one of said first type conditional probability that given the character next to the character at said reference word origin in said reference word was scanned, that the OCR substituted the character next to the character located at said error word origin in said error word;

multiplying means connected to said storage means for multiplying said first one and said second one of said first conditional probabilities, as a first product;

said accessing means accessing from said storage means when said decoded indicium indicates a character splitting propensity, a first one of said second type conditional probability that given the character located at said reference word origin in said reference word was scanned, that the OCR split it into the character located at said error word origin and the character next to the character located at said error word origin in said error word;

said accessing means accessing from said storage means when said decoded indicium indicates a character splitting propensity, a third one of said first type conditional probabilities that given the character next to the character located at said reference word origin in said reference word was scanned, that the OCR substituted the second next character to the character located at said error word origin in said error word;

said multiplying means multiplying said first one of said second type probability and said third one of said first type conditional probability as a second product;

comparison means connected to said multiplying means for comparing the relative magnitudes of said first and said second product;

a running product calculating means connected to said storage means for multiplying a running product times said first one of said first type conditional probabilities if said first product is greater than said second product or said first one of said second type conditional probabilities if said second product is greater than said first product;

a shifting means connected to said comparison means for shifting the location of both said error word origin and said reference word origin by one character position when said first probability product is greater than said second probability product;

said shifting means shifting said error word origin by two character positions and shifting said reference word origin by one character position when said second probability product is greater than said first probability product;

whereby the reference word stored in said storage means having the highest conditional probability of having been misread as the error word stored in said first register, can be determined.

3,969,701

FUNCTION BLOCK ORIENTED SPC SYSTEM

Göran Anders Henrik Hemdal, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 27, 1974, Ser. No. 455,294

Claims priority, application Germany, Apr. 9, 1973, 2317772; Sweden, Apr. 9, 1973, 7304982

Int. Cl.[2] G05B *15/00*; **H04M** *3/00*

U.S. Cl. 340—172.5 **9 Claims**

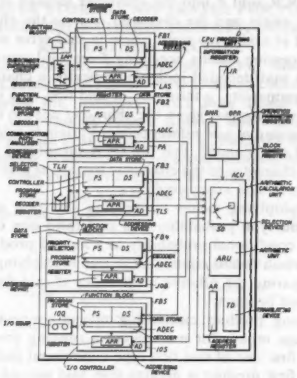
1. In a stored program controlled system wherein devices for the execution of various device functions and computer functions are controlled by a computer having stores for the storage of system control information and having a central processor for the performance of the system control and for the writing and reading, via an information register, of the memory means, said system comprising:

a plurality of function blocks of a first type for performing functions which are delimited from the functions of other blocks, each of said blocks of a first type including both executive devices for performing operating functions and control devices controlling the executive devices;

a plurality of function blocks of a second type, each of said function blocks of a second type including control devices for performing control functions and no executive devices;

each of said function blocks being assigned an associated function block number;

the controlling devices of both types of function blocks being included in the computer, and each of said controlling devices comprising a program store and a data store having read/write terminals for the storage of the control information of its associated function block and addressing means for addressing only the stores of its associated function block;



connecting means for connecting the central processor to the control devices of a number of said function blocks; and

said central processor unit comprising a block number register for the registering of the respective function block numbers, a selection device which is connected to the block number register in order to be set by means of the registered block number, said connection means connecting the addressing means selected by the selection device to the central processor and connecting the write/read terminals of the stores in the control devices to the information register in the central processor for enabling the latter to control, with the aid of the addressing means, the writing and reading in the program stores and in the data stores.

3,969,702

ELECTRONIC COMPUTER WITH INDEPENDENT FUNCTIONAL NETWORKS FOR SIMULTANEOUSLY CARRYING OUT DIFFERENT OPERATIONS ON THE SAME DATA

Giancarlo Tessera, Milan, Italy, assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 2, 1974, Ser. No. 485,468

Claims priority, application Italy, July 10, 1973, 26397/73

Int. Cl.[2] G06F *9/08, 9/20, 13/00*

U.S. Cl. 340—172.5 **16 Claims**

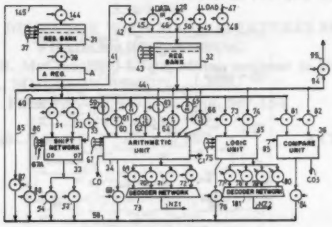
4. A data processing system comprising:

control means;

working storage means for storing units of information representative of instructions and data for at least one program;

logic and arithmetic means coupled to said control means and to said storage means, said logic and arithmetic means including a plurality of independent functionally different processing network means, each being individually coupled to said control means and having input and output terminals;

distribution circuit means coupled to said working storage means for receiving said information;



a plurality of gating means coupled to said distribution circuit means and each coupled to the input terminals of a different predetermined one of said processing network means; and,

said control means being coupled to each of said gating means, said control means being operative to process one of said program instructions said control means in response to said one of said program instructions generating a series of subcommand signals for enabling at least a pair of said gating means to apply the same units of data simultaneously to corresponding ones of said processing network means and for causing each of said corresponding ones of said processing network means for performing different types of operations upon the same units of data.

3,969,703

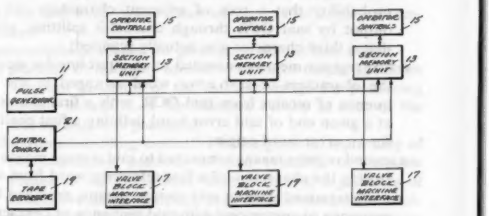
PROGRAMMABLE AUTOMATIC CONTROLLER

Jerome A. Kwiatkowski, and Charles L. Wood, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Oct. 19, 1973, Ser. No. 408,208

Int. Cl.[2] G05B *1/08, 11/18;* **G06F** *3/05, 15/46*

U.S. Cl. 340—172.5 **22 Claims**



1. A programmable automatic controller for controlling at least one machine, said at least one machine including a plurality of cyclically movable components which are actuated in a timed relationship with respect to one another, said movable components each being actuated at respective relative times in each of a plurality of machine cycles, and said at least one machine including machine cycle position indicating means for cyclically moving in synchronism with the cyclic operation of said at least one machine, said controller comprising:

timing means responsive to said machine cycle position indicating means for generating a digital signal in synchronism with the movement of said cycle position indicating means, said digital signal providing an instanta-

neous indication of the time elapsed in each cycle of operation of said machine,

a storage means for storing the sequential relative times in a cycle of machine operation when each of the plurality of components is to be actuated,

means coupled to said storage means for selectively varying the actuating times of selected components stored in said storage means while said machine is operating to thereby change the relative times in each machine cycle when said selected machine components are to be actuated,

means for cyclically reading out the contents of said storage means,

comparator means responsive to said timing means and said readout means for comparing the digital signal corresponding to the time elapsed in each cycle with the relative component actuating times stored in said storage means, said comparator providing an actuating signal when a favorable comparison results, and

addressing means receiving said actuating signal from said comparator means for providing a component operating command to the component whose component actuating time compared with the cycle time elapsed.

3,969,704

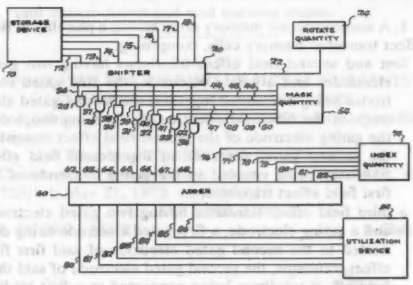
WORD TRANSFORMATION APPARATUS FOR DIGITAL INFORMATION PROCESSING

John T. Liebel, Jr., Williamsville, N.Y., assignor to Nanodata Corporation, Williamsville, N.Y.

Filed July 19, 1974, Ser. No. 490,113

Int. Cl.² G06F 7/00

U.S. Cl. 340—172.5 **10 Claims**



1. In a digital information processing system wherein coded information words are transmitted from a first location in the system through a path to a second location for utilization by said system, word transformation apparatus comprising:

a. word position changing means having an input connected to said path to receive words from said first location and operative to change the relative positions of portions of a word received thereby in a predetermined manner so that a portion of the word which is of current interest is placed in a predetermined location in the word;

b. selective gating means having an input connected to the output of said position changing means and an output connected to said path and operative to gate only said portion of said word placed in said predetermined location to said path for transmission to said second location; and

c. means operatively connected to the output of said selective gating means for adding a quantity to the word portion before it is transmitted to said second system location.

3,969,705

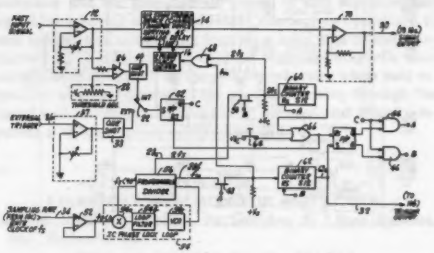
SPECTRUM ANALYZER HAVING MEANS FOR TRANSIENT SIGNAL ANALYSIS

William N. Waggener, Sarasota, Fla., assignor to Weston Instruments, Inc., Newark, N.J.

Filed June 10, 1974, Ser. No. 477,825

Int. Cl.² G11C 21/00

U.S. Cl. 340—173 RC **11 Claims**



1. A spectrum analyzer having a selected first sampling rate and comprising:

means for receiving a fast analog signal whose duration of interest is short as compared with said first sampling rate of the spectrum analyzer;

means for providing a second sampling rate which is substantially higher than said first sampling rate;

means for sampling the fast analog signal at said second sampling rate to provide a succession of fast analog samples of said fast analog signal at said second sampling rate;

analog signal storage means for storing in succession the fast analog samples provided by the sampling means, said storage means including an input for analog samples to be stored therein and an output for analog samples to be read therefrom and having means for shifting all fast analog samples stored therein toward the output for the storing of a new fast analog sample applied to the input;

means for reading the fast analog samples from the storage means at a reading sampling rate which is the same as and synchronous with the first sampling rate to provide a succession of slow analog samples, said reading means including means for shifting all fast analog samples stored in the storage means toward the output for the reading out of a fast analog sample;

means for analyzing analog samples occurring at said first sampling rate to derive signals indicative of the frequency content or power spectrum of the corresponding analog signal; and

means for applying the slow analog samples read out of the storing means to said analyzing means at said first sampling rate.

3,969,706

DYNAMIC RANDOM ACCESS MEMORY MISFET INTEGRATED CIRCUIT

Robert James Proebsting, and Robert Sherman Green, both of Richardson, Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Oct. 8, 1974, Ser. No. 513,091

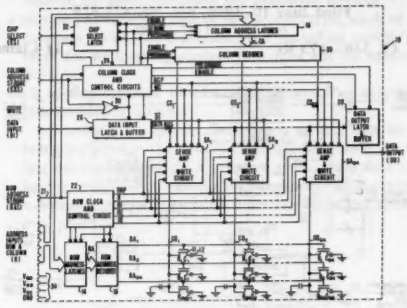
Int. Cl.² G11C 7/00, 7/06, 9/00

U.S. Cl. 340—173 R **30 Claims**

5. The method of addressing a desired memory cell of a memory formed on a monolithic semiconductor chip having a matrix of storage cells arrayed in rows and columns which comprises sequentially applying first and second sets of binary address signals to the same address inputs to the chip to identify the row and column of the desired memory cell.

6. In a random access memory formed on a monolithic semiconductor chip and having a series of precharge periods each followed by a data access period initiated by a strobe signal, the method for outputting data from the chip which

comprises reading data from a selected memory cell during an access period and storing the data read from the cell in a data output latch during the remainder of the access period and at



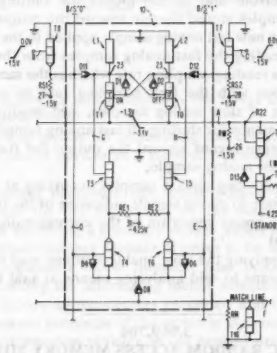
least a portion of the succeeding precharge period, and outputting the data from the data output latch to circuitry external of the chip during at least a portion of said succeeding precharge period.

3,969,707

CONTENT-ADDRESSABLE MEMORY CAPABLE OF A HIGH SPEED SEARCH

Ralph D. Lane, Wappingers Falls, and Richard A. Manning, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,695
Int. Cl.² G11C *15/04, 11/40*
U.S. Cl. 340—173 AM **18 Claims**



1. A content-addressable memory comprising:

a bistable memory cell having flip-flop characteristics including first and second storage elements having input-/output terminals;

means for connecting first and second Search lines with said first and second input/output terminals, respectively;

a Match line:

first and second current switch means associated with said first and second storage elements, respectively, each current switch including: first and second transistors, the emitters of which are connected in common, the base of said first transistor connected to said storage element input/output terminal, the base of said second transistor connected to said Search line, and the collector of said second transistor connected to said Match line;

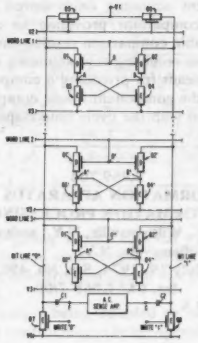
whereby said Match line receives an indication of a match or mismatch when a search bit is compared with a data bit stored in said bistable cell.

3,969,708

STATIC FOUR DEVICE MEMORY CELL

George Sonoda, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 592,148
Int. Cl.² G11C *7/00, 11/40*
U.S. Cl. 340—173 FF **7 Claims**



1. A semiconductor memory array having a plurality of field effect transistor memory cells, comprising:

first and second field effect transistors having two gated electrodes and a gating electrode, the first gated electrodes being connected together, the second gated electrode of the first field effect transistor being coupled to the gating electrode of the second field effect transistor, the second gated electrode of the second field effect transistor being coupled to the gating electrode of the first field effect transistor;

a third field effect transistor having two gated electrodes and a gating electrode, a first gated electrode being connected to the second gated electrode of said first field effect transistor, the second gated electrode of said third field effect transistor being connected to a first bit line, the gating electrode of said third field effect transistor being connected to a word line;

a fourth field effect transistor having two gated electrodes and a gating electrode, a first gated electrode being connected to the second gated electrode of said second field effect transistor, the second gated electrode of said fourth field effect transistor being connected to a second bit line, the gating electrode of said fourth field effect transistor being connected to said word line;

said first and second field effect transistor being enhancement mode field effect transistors; and

said third and fourth field effect transistors being depletion mode field effect transistors.

3,969,709

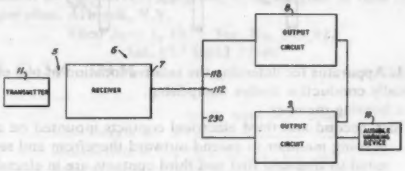
WIRELESS BURGLAR ALARM SYSTEM

Roger Isaacs, 953 E. 9th St., and Albert Stern, 929 E. 18th St., both of Brooklyn, N.Y. 11230

Filed June 26, 1969, Ser. No. 836,848
Int. Cl.² G08B *5/22*
U.S. Cl. 340—224 **49 Claims**

1. A wireless burglar alarm system comprising

a wireless transmitter, and
a receiver,
a first output circuit connected to said receiver and responsive to a first predetermined frequency,
a second output circuit connected to said receiver and responsive to a second predetermined frequency,
warning means connected to said second output circuit as a load thereof,
said first output circuit being connected to said second output circuit,
said transmitter being selectively operable to transmit signals having one of said first and second predetermined frequencies,

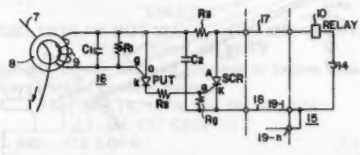


said receiver being operable upon the reception of an input signal from said transmitter to produce an output signal having one of said first and second predetermined frequencies,
said second output circuit being selectively operable upon the application of said output signal from said receiver at said second predetermined frequency to activate said warning means, and
said first output circuit being operable upon the application of said output signal from said receiver at said first predetermined frequency to inhibit the operation of said second output circuit and said warning means.

3,969,710
APPARATUS FOR PICKING UP SIGNAL CURRENTS FLOWING THROUGH SIGNAL LINES

Takeo Arima, Tokyo, Japan, assignor to Hochiki Corporation, Japan

Filed May 22, 1974, Ser. No. 472,451
Claims priority, application Japan, May 25, 1973, 48-60735[U]; May 23, 1973, 48-60980[U]
Int. Cl.² G08B 21/00
U.S. Cl. 340—253 R **4 Claims**

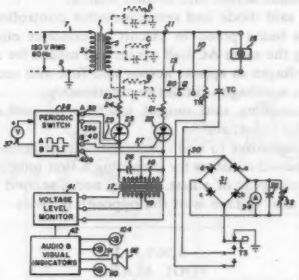


1. An apparatus for discriminating an operated sensor and attached to an alarm system in which a plurality of sensors are connected in parallel between signal lines led from a receiving panel of said alarm system for short-circuiting said signal lines so that a signal current passes through said signal lines when said sensor has detected an abnormal condition, said apparatus comprising an annular magnetic core wound with a pickup coil linked with one of said signal lines for picking up said signal current flowing through said signal lines, thyristor means connected to be turned ON by the voltage induced in said pickup coil, a programmable unijunction transistor connected to said pickup coil and said thyristor for increasing the load impedance of said pickup coil thereby positively turning ON said thyristor, the output of said pickup coil being connected to the gate input of said programmable unijunction transistor, the output of said programmable unijunction transistor being connected to the gate input of said thyristor means, a capacitor connected to be charged from a source of direct current, a discharge circuit connected to said capacitor for discharging said capacitor, said discharge circuit comprising the anode-cathode circuit path of said transistor and the gate-cathode circuit path of said thyristor connected to said anode-cathode circuit path, and to discharge through a discharge circuit including the anode-cathode circuit of said transistor and the gate-cathode circuit of said thyristor, said signal lines having signal and return conductors connected to said sensor, said conductors forming a loop, one of said conductors being magnetically coupled with said magnetic core corresponding to each of the sensors whereby when said respective sensor is operated, the currents flowing through the signal and return conductors being unequal and thereby inducing a voltage across said pickup coil.

3,969,711
LINE ISOLATION MONITOR AND ALARM

Herbert Ahntholz, Berwyn, Ill., assignor to Litton Systems, Inc., Bellwood, Ill.

Filed Apr. 25, 1975, Ser. No. 571,773
Int. Cl.² G08B 21/00
U.S. Cl. 340—255 **13 Claims**



1. A line isolation monitor for monitoring the leakage condition of an isolated electrical system having leads carrying AC voltages of a frequency of F hertz comprising:
a core of magnetic material;
a first winding on said core;
a first end and a second end and a center tap on said winding;
first circuit means connected to one end of said winding and adapted for connection to one of said power lines, comprising resistance means and series connected semiconductor controlled rectifier means;
second circuit means connected between the other end of said winding and adapted for connection to a second of said power lines, said second circuit means including resistance means and series connected semiconductor controlled rectifier means;
periodic switch means coupled to each of said semiconductor controlled rectifier means for alternately and cyclically triggering said semiconductor controlled rectifier means into the current conducting condition;
said switch means having a periodic rate of less than said line frequency;
means connected between said center tap and electrical ground potential for providing a resistive path therebetween to ground and measuring means associated with said last named means for indicating the current level through said path.

12. Condition responsive alarm means comprising:
first means for generating a DC voltage of a first polarity and of a level dependent upon the condition being monitored;

reference voltage source means for providing a predetermined DC voltage of a second polarity, said voltage source means including a potentiometer having a movable tap, diode means, and resistor means;

an output juncture; means electrically connecting said diode means and said resistor means in series circuit between said tap and said output juncture;

thermistor means, said thermistor means being connected in series circuit with said first voltage generating means and said output terminal, whereby said reference voltage and said condition dependent voltage are connected in subtractive relationship to provide a voltage at said output terminal equal to the difference therebetween;

first and second AC voltage sources for providing first and second AC voltages, the level of said second AC voltage source being greater than the level of said first AC source and approximately 180° out of phase therewith;

rectifier means adapted to conduct current only during alternate half cycles of AC and first resistor means connected electrically in series with said rectifier means across said first AC source;

semiconductor controlled rectifier means having an input and adapted to conduct current only during alternate half cycles of AC when said input has a predetermined voltage applied thereto; second resistor means; said second resistor means connected in series with said controlled rectifier means across said second source;

each of said diode and semiconductor controlled rectifier means being poled in circuit to conduct current only during the same AC half cycles and means for combining the voltages as appear across said first and second resistors in a voltage subtractive relationship;

means coupling said output juncture to said controlled rectifier input; and

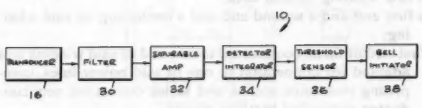
means responsive to said combined voltage across said first and second resistors for providing a first indication when said voltage is of a first polarity and a second indication when said voltage is of the opposite polarity.

3,969,712

POOL ALARM

Jerry Butman, Palos Verdes Peninsula, and Thomas L. Gretenberg, Marina Del Rey, both of Calif., assignors to Applied Systems Laboratories, Palos Verdes Peninsula, Calif.

Filed May 25, 1973, Ser. No. 364,098
Int. Cl.² G08B *13/16*
U.S. Cl. 340—261 **2 Claims**



1. Pool alarm apparatus comprising:

transducer and filter means including a transducer, said means being responsive to noise in water for generating electrical signals representing primarily predetermined frequency components of the noise;

integrator means coupled to said transducer and filter means for generating a signal which increases in amplitude when signals are received from the filter means over an extended period of time;

threshold responsive means coupled to said integrator means for initiating an alarm when the integrator output reaches a predetermined level;

a watertight housing containing said integrator means and threshold responsive means, said housing being buoyant in water and floating in a predetermined orientation, and said housing having a downwardly facing aperture containing said transducer; and

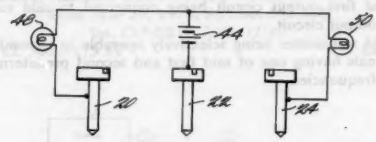
a tilt sensitive switch on said housing, which prevents alarm initiation unless the housing is substantially level.

3,969,713

BOLT STRESS DETECTOR

Robert Bossler, Jr., Bloomfield, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Apr. 2, 1974, Ser. No. 457,346
Int. Cl.² G01B *7/28*
U.S. Cl. 340—265 **4 Claims**



1. Apparatus for detecting the relative location of two electrically conductive bodies comprising:

a housing member,

first, second and third electrical contacts mounted on said housing member to extend outward therefrom and separated so that said first and third contacts are in electrical connection with said first body when said second contact is in electrical connection with said second body, each said contact comprising a screw movable inward and outward,

first and second indicator means for providing an indication when an electrical signal is applied, and

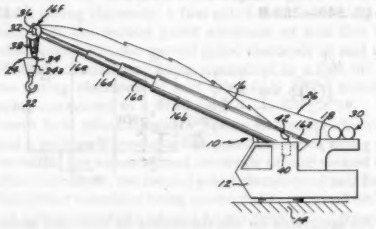
means for connecting said first, second and third contacts to a source of electrical energy so that said first indicator means provides said indication when said first contact is electrically connected to said second contact and said second indicator means provides said indication when said third contact is electrically connected to said second contact.

3,969,714

SAFETY SYSTEM FOR CRANES

Gerald L. Greer, 1300 Westcliff Drive, Newport Beach, Calif. 92660

Filed Jan. 6, 1975, Ser. No. 538,554
Int. Cl.² G08B *21/00*
U.S. Cl. 340—267 C **3 Claims**



1. A safety system for cranes having a boom, a load-carrying device thereon movable with respect to said boom to raise and lower a load as desired and an operator's cab, comprising in combination,

a radio signal transmitter mounted at one end of said boom and having its own portable source of electric power thereat,

an on-off control switch connected in circuit with said transmitter and said source of power having at least one pair of cooperating electrical contacts and biasing means associated therewith biasing said contacts to open circuit relation to effect energization of said transmitter by said source when moved to closed circuit relation against said biasing means, said switch being suspended a predeter-

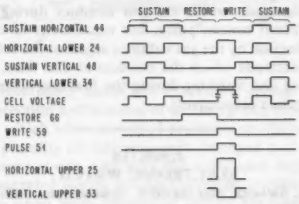
mined distance below said one end of said boom to be operated by upward movement of said load-carrying means before it contacts said one end of said boom,

and warning means including a radio signal receiver connected in circuit with the electrical energy source in the operator's cab of said crane normally used to power said crane and a warning device in said cab and in circuit with said receiver to be energized when, but only when, said receiver is receiving a signal from said transmitter.

3,969,715
GAS PANEL WITH IMPROVED WRITE CIRCUIT AND OPERATION

William R. Lamoureux, Kingston, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed June 1, 1973, Ser. No. 365,922
Int. Cl.² H01J *17/48*
U.S. Cl. 340—324 M **6 Claims**



1. A gas panel of the type having light emitting cells formed at crossover points of two sets of conductors, comprising,

means to apply between the conductors of said two sets a sustain waveform having positive and negative rectangular pulses,

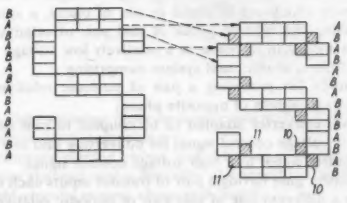
means to apply between the conductors of a selected cell a waveform of a predetermined polarity and of an amplitude and width to produce a write operation, and

means for timing the occurrence of said write waveform with respect to said sustain waveform to produce a transition that is substantially continuous from said write waveform to a sustain voltage level in the opposite polarity over an interval that is short enough to prevent the cell from being erased as a result of the ionization associated with the transition.

3,969,716
GENERATION OF DOT MATRIX CHARACTERS ON A TELEVISION DISPLAY

Alan Roberts, Sutton, England, assignor to British Broadcasting Corporation, London, England

Filed July 10, 1974, Ser. No. 487,124
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD **3 Claims**

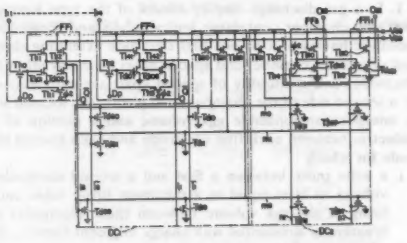


1. Interpolation apparatus responsive to a line-interlaced video signal having first fields alternating with second fields and representing a dot matrix character in a matrix of cells, each composed of segments of two lines adjacent each other in the interlaced picture, said apparatus comprising delay means operative to establish four signals, of which three are delayed by one dot period, by one line period, and by one line period plus one dot period respectively relative to the fourth signal, a logic circuit responsive to predetermined logical combinations of said four signals to detect diagonal portions of the character, and means controlled by the logic circuit to add half-dot period pulses in lines of the first fields and in lines of the second fields delayed by a line period, so as to fill in cornerwise opposed quarters of the cells to either side of a diagonal portion in the display of the character represented by the first fields and the line delayed second fields.

3,969,717
DIGITAL CIRCUIT TO ELIMINATE DISPLAY FLICKER

Yoshikazu Hatsukano, Kodaira; Kosei Nomiya, Tokyo, and Hiroto Kawagoe, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 332,522, Feb. 14, 1973, Pat. No. 3,870,897. This application Nov. 20, 1974, Ser. No. 525,674
Claims priority, application Japan, Feb. 14, 1972, 47-14805
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **4 Claims**



1. A circuit comprising:

a plurality of input terminals to which respective information signals are applied;

a logical circuit, coupled to receive said information signals and to effect a prescribed logical operation thereon;

an output circuit, coupled to said logical circuit, for providing an indication of the operation of said logical circuit on said information signals, including a display device for luminously displaying the result of the operation of said logical circuit on said information signals;

a plurality of first delay means, respectively connected between said plurality of input terminals and said logical circuit, for controlling the application of said information signals to said logical circuit in accordance with a first pulse signal;

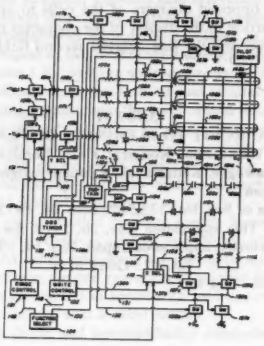
a multiplicity of second delay means, respectively connected between said logical circuit and said output circuit, for receiving the result of the operation of said logical circuit and applying said result to said output circuit in accordance with a second pulse signal having a phase difference relative to said first pulse signal; and

an input shift register for supplying information signals at the outputs of respective stages thereof and for shifting the contents thereof in synchronism with said first and second pulse signals.

3,969,718
PLASMA PANEL PRE-WRITE CONDITIONING APPARATUS

Richard A. Strom, Eagan, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 18, 1974, Ser. No. 534,037
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **13 Claims**



1. In a gas discharge display matrix of the type having at least one chamber containing ionizable gas and formed of a dielectric having at least one first electrode extending along a first side of the chamber and spaced apart from any other first electrodes and a plurality of spaced apart second electrodes on a second side of the chamber, said electrodes located so as to interpose an ionizable gas volume and a portion of the dielectric between each first electrode and each second electrode for which

i. a write pulse between a first and a second electrode of voltage at least equal to a minimum firing value causes firing of the gas volume between these electrodes and creation of substantial wall charge adjacent thereto, if no adjacent wall charge is present,

ii. a sustain pulse between a first and a second electrode of voltage in a range between preselected minimum and maximum sustain values causes firing of the gas volume between these electrodes and creation of a substantial wall charge adjacent thereto if substantial wall charge of polarity discharged by the sustain pulse is present, and insures not firing otherwise, and

iii. an erase pulse between a first and a second electrode of voltage between preselected maximum and minimum erase voltages and of polarity discharging wall charge adjacent the gas volumes between these electrodes created by a previous sustain pulse, insures removal of substantially all of said wall charge, and

means for applying to the electrodes said write, sustain and erase pulses in the manner indicated;

improved apparatus for making free electrons available to selected gas volumes for increasing reliability in firing by a write pulse, and comprising:

a. timing means for receiving a write select signal specifying at least one first electrode and for issuing responsive thereto at least one timing signal occuring prior to the associated write pulses, and following a selected sustain pulse having preselected first polarity; and

b. means receiving each timing signal and write select signal for applying between the selected first electrode and the plurality of second electrodes first and second dual-on-state biasing pulses, and a dual-on-state firing pulse all superimposed on each other where overlapped;

i. each of said first biasing pulses starting responsive to the first timing signal and having a predetermined duration, reaching a predetermined magnitude appreciably different from zero and no greater than the maximum sustain voltage and having the same polarity, measured with respect to the electrodes involved, as was created by the selected sustain pulse;

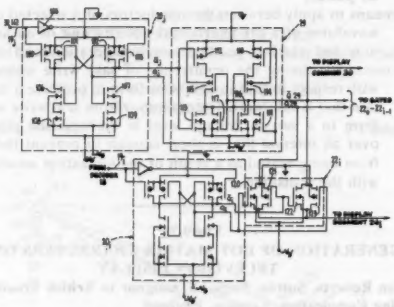
ii. each of said second biasing pulses having polarity opposite that of the first biasing pulse, starting after the first biasing pulse and having a predetermined duration, and a predetermined magnitude substantially different from zero and no greater than the minimum sustain voltage; and

iii. each of said firing pulses having polarity opposite that of the first biasing pulse, having magnitude less than the minimum write voltage and sufficient to cause conduction, when superimposed on the first biasing pulse, by each gas volume between the plurality of second electrodes and the selected first electrode which did not conduct during the most recent sustain pulse, but insufficient to cause conduction by the gas volumes adjacent the selected first electrode which did conduct at that time, and starting and finishing during the first and second biasing pulses respectively.

3,969,719
ELECTRONIC WATCH

Richard L. Sirocka, and David F. Broxterman, both of Sunnyvale, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 320,223, Jan. 2, 1973, Pat. No. 3,815,354.
This application May 9, 1974, Ser. No. 468,344
Int. Cl.² H03K *17/60, 1/12*
U.S. Cl. 340—336 **9 Claims**



1. In an electronic time keeping system including a liquid crystal display having at least one pair of energizing electrodes for receiving a pair of relatively high voltages of the same frequency which are in phase or out of phase, a system for controlling the relative phase of said pair of relatively high voltage signals in response to a relatively low voltage control signal from a source, said system comprising:

a source for providing a pair of periodic relatively high voltage signals of opposite phase;

a level converter adapted to be coupled to said source of low voltage control signal for converting said low voltage control signal to a high voltage control signal;

a transfer gate having a pair of transfer inputs each coupled to a different one of said pair of periodic relatively high voltage signals and a control portion coupled to said level converter for transmitting a first one of said pair of periodic relatively high voltage signals to the output of said transfer gate in the absence of said control signal and for

transmitting the other one of said pair of periodic relatively high voltage signals to said output when said control signal is present; and

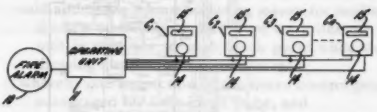
means for applying one of said pair of relatively high voltage signals to one electrode of said display and for applying said output to the other of said electrodes of said display.

3,969,720

EMERGENCY ALARM AND EVACUATION SYSTEM

Shiro Nishino, No. 462, Nakakosaka, Higashiosaka, Osaka, Japan

Filed July 18, 1975, Ser. No. 597,208
Claims priority, application Japan, July 26, 1974, 49-86322
Int. Cl.[2] G08B 7/00
U.S. Cl. 340—371 9 Claims



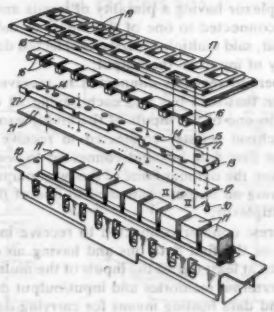
1. An emergency alarm and evacuation system for indicating the direction and location of an emergency exit comprising an alarm which when activated produces an electrical output signal, a plurality of indicator units arranged in a line toward said emergency exit, said indicator units each including electrically operated means for generating an audible and visual indication upon being energized, and an operating unit coupled to said alarm and being operable in response to an output signal from said alarm to successively energize said indicator units to produce a simultaneous visual and audible indication at each unit which if followed lead to said exit.

3,969,721

LIGHT EMITTING DIODE INDICATOR ASSEMBLY FOR A MULTIPLE PUSHBUTTON ARRAY

Donald Thornton Chadwick, Ottawa, and Gerd Kuhfus, London, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 10, 1975, Ser. No. 630,159
Int. Cl.[2] G09F 3/14; H01H 3/12
U.S. Cl. 340—381 5 Claims



1. A light emitting diode indicator assembly for a multiple pushbutton array comprising:

an elongate printed circuit board having a plurality of circuits thereon and a plurality of connection positions to said circuits spaced along said board;

an elongate electrically insulating spacer attached to one surface of said printed circuit board, said spacer including a plurality of locations for a plurality of light emitting diodes, a diode at each location, said location each associated with a related connection position on said printed circuit board;

a light emitting diode inserted at each of said locations, each diode including leads passing through said spacer and electrically connected to the related circuit at the related connection position;

a plurality of lenses positioned over said light emitting diodes, a lens over each diode;

a bezel having a plurality of first apertures extending in a line and a lens positioned in each of said first apertures, and a plurality of second apertures extending in a line alongside said first apertures, each second aperture in lateral alignment with a related first aperture, said second apertures for reception of a pushbutton key in each of said second apertures;

said bezel including a longitudinally extending wall and a longitudinally extending web, said wall and web spaced apart to define a recess beneath said first apertures for the reception of said spacer;

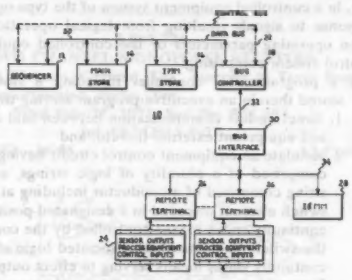
interengaging formations on said wall and web of said bezel and on side edges of said spacer, said formations arranges such that when the spacer is inserted in said recess and moved longitudinally, the formations interengage to retain said spacer in said recess.

3,969,722

METHOD AND APPARATUS FOR OPERATOR INTERROGATION OF SIMULATED CONTROL CIRCUITS

William J. Danco, and Arthur P. Given, both of Roanoke, Va., assignors to General Electric Company, Salem, Va.

Filed July 3, 1974, Ser. No. 485,765
Int. Cl.[2] G06F 3/00
U.S. Cl. 340—172.5 19 Claims



1. An operator console for communicating with a computer, said computer including a memory having an executive program stored therein for directing communication between said computer and said console and for simulating an equipment control circuit having a format comprised of a plurality of logic strings each including logic elements, at least one of which is a switch element having a logical condition and another of which is a continuity status means having a conducting condition controlled by the conditions of the switch elements of its associated logic string, said continuity status means serving to effect output control signals from said controller to equipment external thereto, said operator console comprising:

a. means to specify a logic string and a logic element in said string;

b. means to communicate to said computer the specified string and element whereby said computer can retrieve data relative thereto from said memory for communication to said console;

c. display means responsive to said data for displaying indicia identifying the specified logic element and its condition; and

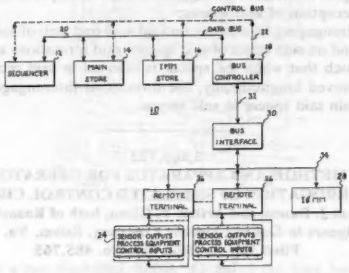
d. means for communicating indexing signals to said computer to direct said computer to retrieve data relative to additional logic elements in the specified logic string from said memory for communication to said console for display by said display means.

3,969,723

ON-LINE MODIFICATION OF COMPUTER PROGRAMS

Philip R. Kennicott, Scotia, N.Y., assignor to General Electric Company, Salem, Va.

Filed July 3, 1974, Ser. No. 485,766
Int. Cl.[2] G06F 3/00
U.S. Cl. 340—172.5 15 Claims



1. In a controlled equipment system of the type operable in response to signals resulting from logical operations based upon operating parameters of the controlled equipment, a control system comprising:

a. a programmable controller including a store having stored therein an executive program serving to,

1. direct on-line communication between said controller and equipment external thereto, and

2. simulate an equipment control circuit having a format comprised of a plurality of logic strings, each logic string comprised of a conductor including at least one switch element disposed in a designated position and a continuity status means controlled by the condition of the switch elements of its associated logic string, said continuity status means serving to effect output signals from said controller to the equipment external thereto; and,

b. a programming console in communication with said controller comprising:

1. means for specifying to said controller a one of the simulated logic strings to be modified,

2. means for directing said controller to copy the simulated specified logic string into a predetermined region in said store while retaining the specified logic string in the executive program,

3. means for specifying to said controller a position in the conductor of the logic string copied,

4. means for modifying the copied logic string by specifying to said controller a type of switch element,

5. means for directing said controller to test the modified logic string on-line as a part of the executive program in place of the retained specified logic string, and

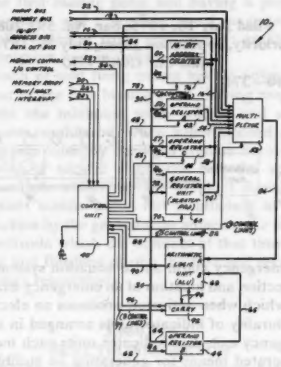
6. means for directing said controller to replace the retained specified logic string with the modified logic string while maintaining the modified logic string on-line whereby the modified logic string becomes an integral part of the executive program to control the external equipment in accordance with the logic now defined by the modified logic string.

3,969,724

CENTRAL PROCESSING UNIT FOR USE IN A MICROPROCESSOR

Terry M. Anderson, Minnetonka, and Reinhard Schumann, St. Paul, both of Minn., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Apr. 4, 1975, Ser. No. 565,239
Int. Cl.[2] G06F 9/14, 9/18
U.S. Cl. 340—172.5 4 Claims



1. In a microprocessor having a central processing unit, memories external to the central processing unit and operatively connected thereto, and input/output devices operatively connected to the central processing unit, said microprocessor operating in response to input macro instructions stored in one of the external memories, said central processing unit comprising:

a. a first data bus to carry data through the central processing unit and to cary data to the external memories and input/output devices;

b. an arithmetic logic unit which performs operations on the data, said unit having two inputs for receiving operand data, and said unit supplying resulting data to the first data bus;

c. a carry register associated with the arithmetic logic unit;

d. a multiplexor having a plurality of inputs and having an output connected to one of the inputs of the arithmetic logic unit, said multiplexor passing selected data from the plurality of inputs to the output;

e. two operand registers connected to receive input data from the first data bus and each having an output connected to one of the inputs of the multiplexor;

f. a scratchpad register connected to receive input data from the first data bus and connected to receive an address from the output of one of the two operand registers, and having an output connected to one of the inputs of the multiplexor;

g. an address counter connected to receive input address data from the first data bus and having an output connected to at least one of the inputs of the multiplexor, and to the external memories and input/output devices;

h. a second data bussing means for carrying data from the external memories and input/output devices to one of the inputs of the multiplexor;

i. a third operand register connected to receive input data from the first data bus and having an output connected to the other input of the arithmetic logic unit; and

j. a control unit including:

1. a read only memory having a plurality of addressable word locations each storing an instruction of a present micro control program, and having a plurality of outputs for supplying data to one of the inputs of the

multiplexor and for supplying control signals in dependence upon the micro instruction to each counter, register and unit in the central processing unit over a plurality of control lines;

2. a source of clock pulses;

3. means for addressing one of the word locations so as to output control signals therefrom,

said addressing means having a first operating mode for incrementally addressing the word locations in a predetermined sequence and a second actuatable operating mode for addressing a specific one of the word locations,

said addressing means including means for incrementing a multiple-bit binary address stored in the addressing means in response to each clock pulse while the addressing means is in the first mode, and

said addressing means including means for loading the specific address outputted from the arithmetic logic unit in response to each clock pulse while the addressing means is in the second mode,

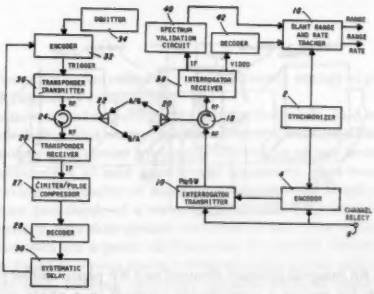
whereby one instruction of the micro control program is executed for each clock pulse; and

4. mode control means for actuating the addressing means from the first mode to the second mode in dependence upon the micro instruction represented by certain control signals supplied from the memory outputs, said mode control means including means for receiving a plurality of input status signals from the external memories and other units external to the central processing unit and from the carry register, each status signal having a first or second signal level and passing a selected one of the status signals in dependence upon the certain control signals, and means responsive to the selected status signals actuating the addressing means to its second mode when the selected status signal exhibits the second signal level.

3,969,725
DISTANCE MEASURING EQUIPMENT

James Benedict Couvillon, Dallas; William Dorsey Daniels, Richardson; Ronald Lee Gassner, Richardson, and Robert Allen Maher, Richardson, all of Tex., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed June 12, 1974, Ser. No. 478,651
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 R **5 Claims**



1. Distance measuring equipment for measuring the distance from an airborne interrogator to a ground based transponder comprising;

an interrogator encoder for providing a linear frequency modulated pulse modulated signal with selectable slope sign;

interrogator transmitter means for mixing a preselected radio frequency signal with the interrogator encoder pulse and transmitting the resulting radio frequency pulse;

transponder receiver means for receiving interrogator transmissions and providing an intermediate frequency output in response thereto;

a matched pulse compression filter coupled to the transponder receiver for providing time compression and signal to noise gain for intermediate frequency signals having a preselected center frequency and linear frequency modulated frequency modulation with separate detection for both modulation slope signs;

transponder decoder means coupled to the pulse compression filter for detecting the arrival of the leading edge of a received pulse and providing an output pulse indicating said arrival;

transponder transmitter means coupled to said transponder decoder means for transmitting a pulse of radio frequency signals at a preselected frequency in response to the decoder output;

interrogator receiver means for receiving transponder transmissions and providing an intermediate frequency output in response thereto;

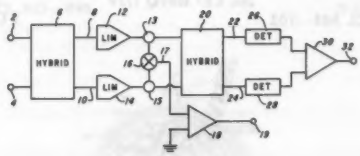
interrogator decoder means coupled to the interrogator receiver for detecting the arrival of a transponder pulse having a preselected center frequency and providing an output indicating said arrival; and

range calculating means coupled to the interrogator encoder and the interrogator decoder for measuring the time between an interrogator transmission and reception of a transponder transmission and providing an output proportional to the distance from the interrogator to the transponder.

3,969,726
TWO CHANNEL MONOPULSE RECEIVER

S. Vincent Birleson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 27, 1975, Ser. No. 553,394
Int. Cl.² G01S 9/22
U.S. Cl. 343—16 M **12 Claims**



1. A monopulse receiver for processing signals received from a target by a monopulse antenna comprising:

a first signal processing means coupled to the output of the monopulse antenna for receiving sum and difference signals from said antenna and for generating equal amplitude outputs having a phase difference proportional to the amplitude difference of said sum and difference signals,

amplifier means coupled to the output of said first signal processing means for generating signals having a preselected amplitude and the same phase difference as said first signal processing means outputs,

second signal processing means having an input coupled to the output of said amplifier means for generating outputs having the same amplitude ratio as said sum and difference signals, and

subtractor means coupled to the output of said second signal processing means for providing an output proportional to the amplitude difference of said second signal processing means outputs.

3,969,727
POSITION DETECTING DEVICE FOR OMEGA RECEIVING SYSTEM

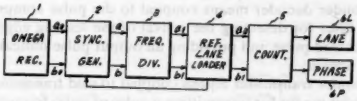
Hideki Tanaka, Takatsuki; Kazutaka Ishida, Suita; Minoru Handa, Ikoma, and Asao Kitabatake, Kakogawa, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Sept. 9, 1974, Ser. No. 504,133

Claims priority, application Japan, Oct. 29, 1973, 48-121498

Int. Cl.² G01S 1/30

U.S. Cl. 343—105 R 5 Claims



1. A position detecting device for an omega receiving system, comprising means for receiving first and second omega signals from first and second omega transmitting stations and generating first and second synchronized signals of said first and second omega signals, means for frequency-dividing said first and second synchronized signals by a common divisor to produce first and second frequency-divided waves, means for dividing the phase difference between said first and second frequency-divided waves by the period of said omega signals and producing the resultant integral quotient as the lane number and the remainder as the phase difference between said first and second omega signals, and reference lane loading means for shifting in phase said first frequency-divided wave with respect to said second frequecy-divided wave until the phase difference therebetween becomes equal to said phase difference between said omega signals plus a specific length of time corresponding to the reference lane number.

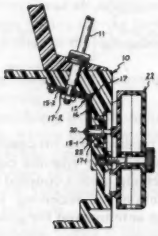
3,969,728
STRIPLINE ANTENNA SWITCH

Roy F. Hodsdon, and Jerry M. Barringer, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Sept. 24, 1975, Ser. No. 616,261

Int. Cl.² H01Q 1/24

U.S. Cl. 343—702 3 Claims



1. For use in a portable radio or the like housed in a cabinet having an antenna mounted thereon, an improved stripline switch for selectively connecting a circuit of said radio to said mounted antenna or to an external antenna, said switch comprising:

a. a wall adapted to be part of the radio housing, said wall having a first opening therethrough;

b. a first metallic plate having a first portion with a first opening therethrough and having a second portion with a second opening therethrough;

c. means mounting said first plate on an interior surface of said wall with said first opening of said first plate substantially coinciding with said first opening of said wall;

d. a pin terminal mounted on said interior surface of said wall and within said second opening of said first plate, said pin terminal being spaced from the edges of said second opening of said first plate and extending above said first plate in one direction and extending in the opposite direction through said wall to the outer surface thereof;

e. an electrical insulating plate having a first opening therethrough;

f. means mounting said electrical insulating plate on at least said first portion of said first plate with said first opening of said insulating plate substantially coinciding with said first opening of said first plate and with said first opening through said wall;

g. a second metallic plate;

h. means mounting said second metallic plate on said electrical insulating plate so that said second metallic plate is electrically insulated from said first metallic plate and is in movable contact with said pin terminal;

i. an insulated plunger connected to said second metallic plate and extending through said first opening of said insulating plate, said first opening of said first plate, and said first opening of said wall, said insulated plunger being mechanically urged from said second metallic plate toward said wall;

j. means for connecting said second metallic plate to an antenna mounted on said radio;

k. means for connecting said pin terminal to the circuit of said radio apparatus;

l. and an external plug adapted to be attached to said outer surface of said wall, said plug having at least one electrical contact positioned to engage said pin terminal and having an insulated boss adapted to engage said insulated plunger, whereby when said external plug is attached to said outer wall surface, electrical contact is made between said electrical contact of said plug and said pin terminal, and said second metallic plate is moved to break electrical contact between said pin terminal and said second metallic plate.

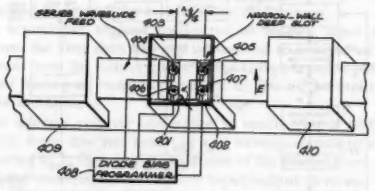
3,969,729
NETWORK-FED PHASED ARRAY ANTENNA SYSTEM WITH INTRINSIC RF PHASE SHIFT CAPABILITY

Jeffrey T. Nemit, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,705

Int. Cl.² H01Q 3/26

U.S. Cl. 343—756 16 Claims



1. An integral antenna element and RF phase shifter particularly for use as a controllable element in a phase scanned array fed from an RF transmission line of a type selected from a group including waveguide and stripline, said transmission line having longitudinal conductive outer walls through which RF energy may be coupled by means of slots, comprising:

means including a pair of slot patterns through one of said outer walls, the slots of said patterns being placed symmetrically about the longitudinal centerline of said one outer wall, each of said slot patterns thereby capable of

providing coupling on both sides of said longitudinal centerline of said outer wall;

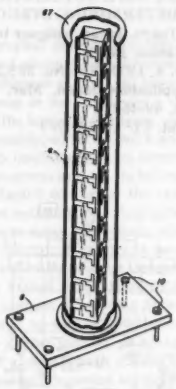
and means including at least four RF devices each of a type capable of providing a controlled RF admittance path for providing admittance ranging at least between discrete minimum and maximum values as a function of a corresponding control signal applied thereto, at least two of said RF devices being placed to control corresonding admittance paths within one of said slot patterns with one of said RF devices on each side of said longitudinal centerline of said outer wall.

3,969,730

CROSS SLOT OMNIDIRECTIONAL ANTENNA

Troy D. Fuchser, Plano, Tex., assignor to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Feb. 12, 1975, Ser. No. 549,604
Int. Cl.[2] H01Q *13/12*
U.S. Cl. 343—770 7 Claims



1. An antenna for radiating radio frequency energy at preselected frequency comprising:

a hollow member having thin conductive walls, said member being four way symmetric about a vertical axis and having a maximum horizontal dimension of less than one wavelength at said preselected frequency, said member having a plurality of horizontal slots having lengths less than two-thirds of a wavelength at said preselected frequency, said slots spaced vertically in two rows, each row centered on a point of maximum horizontal dimension, and said two rows spaced symmetrically about said vertical axis, forming vertically stacked pairs of cross slot radiating elements,

power divider means having an input for receiving RF energy at said preselected frequency and one output for each of said slot radiating elements and

means for coupling RF energy from said power divider means to said slots to be radiated,

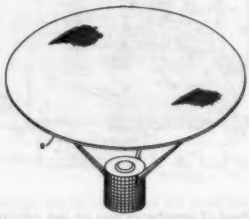
whereby said RF energy is radiated in an omnidirectional pattern.

3,969,731

MESH ARTICLES PARTICULARLY FOR USE AS REFLECTORS OF RADIO WAVES

Robert K. Jenkins, Huntington Beach; Leon B. Keller, Palos Verdes Peninsula, and John H. Cover, Jr., Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 9,132, Feb. 11, 1970, abandoned, which is a continuation of Ser. No. 590,571, Oct. 31, 1966, abandoned. This application Feb. 19, 1974, Ser. No. 443,645
Int. Cl.[2] H01Q *15/20*
U.S. Cl. 343—840 10 Claims



1. A folded antenna for radio waves comprising a peripheral ring support, a flexible non-woven preformed mesh member having dimensional stability secured to said support, said mesh member comprising criss-crossing flexible fibers of negligible extensibility having a modulus of elasticity and yield strength sufficient for providing the negligible extensibility, each of said fibers integrally bonded to said ring support.

3,969,732

SPIRAL ANTENNA CIRCUIT

Albert L. Holloway, 941 Jackling Drive, Hillsborough, Calif. 94010

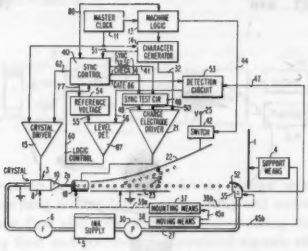
Filed Apr. 24, 1975, Ser. No. 571,423
Int. Cl.[2] H01Q *1/36*
U.S. Cl. 343—895 8 Claims

1. A spiral antenna circuit comprising first and second antenna elements, each having at least one continuously scaled logarithmic spiral having a width continuously growing and at least one continuously scaled inverse logarithmic spiral having a termination with a termination point and having a width continuously diminishing to said termination point, wherein the inverse logarithmic spiral has an in continuum coupling to the logarithmic spiral; said continuously scaled logarithmic spiral being constructed from logarithmic equations and said continuously scaled inverse logarithmic spiral being constructed from inverse logarithmic equations.

3,969,733
SUB-HARMONIC PHASE CONTROL FOR AN INK JET RECORDING SYSTEM

Richard A. DeMoss, and Howard T. Hilton, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,968
Int. Cl.² G01D 18/00
U.S. Cl. 346—1 **10 Claims**



1. The method of synchronizing an ink recording system of the type wherein a stream of individual droplets generated by a perturbation of an ink jet filament at a predetermined rate are each selectively charged by a charging electrical field applied to the droplets in the region where said ink jet filament breaks into said stream of droplets for deflection by an electrostatic deflection field, the method comprising the steps of:

during a sync test cycle, modulating said drop charging field to provide a series of narrow charging pulse fields for a portion of the time a drop is in said region at a repetition rate which is a sub-harmonic of said predetermined rate;

induction sensing the charging of said charged drops to provide charge sense signals;

amplifying said charge sense signals in a narrow frequency band centered at said modulation charge repetition rate;

accumulating said amplified signals for a predetermined period;

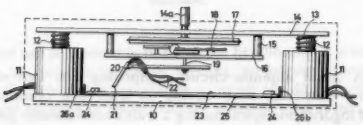
comparing said accumulated signal to a predetermined signal to detect a deviation of said modulation from a desired phase; and

adjusting the relative phase of said perturbation and said modulation to correct any said detected deviation.

3,969,734
APPARATUS FOR RECORDING PNEUMATIC PRESSURES

Johann Klein, Overbeckstr. 2-4, 5 Cologne 30, Germany

Filed Aug. 8, 1974, Ser. No. 495,791
Claims priority, application Germany, Aug. 11, 1973, 2340813
Int. Cl.² G01D 5/06; A61B 5/02
U.S. Cl. 346—33 ME **7 Claims**

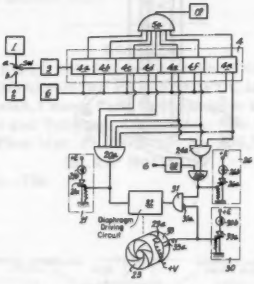


1. In a recording device, support means for supporting a sheet material on which information is to be recorded, frame means carrying a marking means for marking information on sheet material carried by said support means, pneumatic pressure-responsive means carried by said frame means and operatively connected with said marking means for moving the latter in response to a change in the pressure of air received by said pneumatic pressure-responsive means, moving means for responding to a predetermined signal and being operatively connected to said frame means for moving the latter in response to said signal from a non-marking position where said marking means is spaced from a sheet material carried by said support means to a marking position where said marking means engages a sheet material carried by said support means, said moving means maintaining said frame means and said pressure-responsive means and marking means carried thereby in said marking position while said signal is received by said moving means, and signal-transmitting means for transmitting said signal to said moving means in response to a given change in the pressure of air received by said pneumatic pressure-responsive means, said signal-transmitting means acting through said moving means for maintaining said frame means in said marking position while said signal is transmitted to said moving means, so that in response to said signal said marking means engages the sheet material to record thereon said change in air pressure which occurs during transmission of said signal to said moving means, said frame means including a plate which carries said pressure-responsive means and marking means, and said moving means including an electromagnetic means operatively connected with said plate for moving the latter toward said support means from said non-marking to said marking position.

3,969,735
CAMERA WITH AUTOMATIC EXPOSURE-DETERMINING STRUCTURE

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 4, 1975, Ser. No. 555,298
Claims priority, application Japan, Mar. 11, 1974, 49-27921; Apr. 24, 1974, 49-46237
Int. Cl.² G03B 7/14
U.S. Cl. 354—29 **11 Claims**



11. In a camera, light-responsive means for providing a signal corresponding to light brightness, exposure-time determining means for automatically determining exposure time, said exposure-time determining means being connected with said light-responsive means for determining exposure time when the signal provided by said light-responsive means corresponds to a given range of light brightness, detecting means connected with said exposure-time determining means for detecting when the signal provided by said light-responsive means is beyond at least one end of said range, means connected to said detecting means for preventing opening of a shutter of the camera when said detecting means detects that the singal provided by said light-responsive means is beyond said one end of said range, and diaphragm-adjusting means connected with said detecting means for automatically adjusting a diaphragm of the camera when said detecting means detects that said signal is beyond said one end of said range,

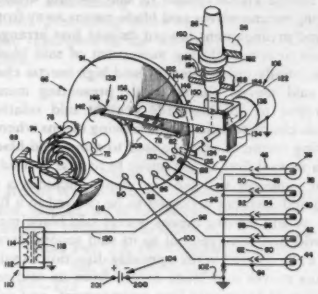
so that immediately thereafter exposure operations can be carried out with the automatically adjusted diaphragm.

3,969,736

PHOTOGRAPHIC CAMERA AND FLASH LAMP SELECTION SYSTEM

Walter G. Lehmann, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,939
Int. Cl.² G03B *15/04*
U.S. Cl. 354—127 **8 Claims**



1. A photographic camera operable to produce an artificially illuminated photographic exposure in conjunction with an array of flashlamps of the kind having an individual terminal for each lamp in the array and a common terminal connected to all of the lamps in the array, said camera comprising, means for releasably receiving such an array and comprising a set of mutually insulated camera terminals for contacting the terminals of the array, said set including a first common camera terminal adapted to engage the common terminal of the array; means for initiating a photographic exposure cycle; first and second power supply terminals adapted to be connected to a source of electrical energy; a second common camera terminal; first switching means connected to said exposure cycle initiating means and operable thereby to sequentially connect all of said set of camera terminals except said first common terminal to said second common terminal during each exposure cycle; second switching means operable to open and close a circuit path connecting said first common terminal, said second common terminal, and said power supply terminals in series; and means for detecting the ignition of a lamp in an array received in said camera for operating said second switching means to open said path.

3,969,737

ELECTRONIC FLASH UNIT FOR CAMERAS ADAPTED TO RECEIVE FLASHBULBS

Edward Summers Kendrick, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

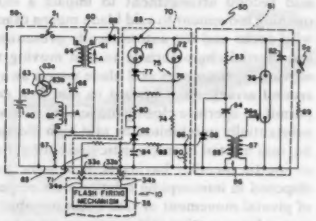
Filed Aug. 1, 1974, Ser. No. 493,573
Int. Cl.² G03B *15/03*
U.S. Cl. 354—141 **8 Claims**

5. In an improved electronic flash unit having a flashtube, a flashtube trigger circuit including a trigger capacitor for initiating a flash-triggering operation, a flash firing capacitor for producing a sustained flash following flash-firing energization, and means for connecting said trigger and firing capacitors to a source of electrical potential for controllably charging said trigger and firing capacitors, said electronic flash unit further including input means for coupling said flash unit to a camera having a shutter and a flash lamp firing mechanism of the type which produces a flash lamp energization signal in response to actuation of the camera in timed relation to operation of the camera shutter, the improvement comprising:

a. first electronic switching means having a gate electrode operatively associated with said flashtube trigger circuit for controlling triggering of said flashtube; and

b. circuit means interconnecting said input means and said first electronic switching means, said circuit means including:

i. means having a resistor and timing capacitor for producing a control signal having a particular amplitude in a time interval following initiation of the flash lamp energization signal proportional to the product of the resistance and capacitance value;



ii. first voltage-sensitive means for producing a signal to render said control signal producing means effective to produce said control signal once said firing capacitor is charged above a predetermined level;

iii. second electronic switching means having a gate electrode electrically coupled to said input means for permitting said timing capacitor to charge following initiation of the flash lamp energization signal; and

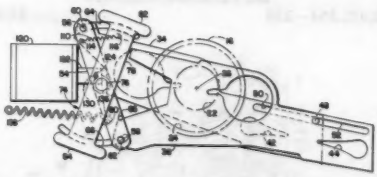
iiii. second voltage-sensitive means having a nonconductive state for rendering said circuit means non-conductive, said second voltagesensitive means assuming said non-conductive state during a flashtube-firing operation to effectively open circuit said resistor and capacitor combination.

3,969,738

EXPOSURE CONTROL SYSTEM WITH INERTIAL CHARACTERISTIC

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 5, 1975, Ser. No. 574,695
Int. Cl.² G03B *9/08, 9/58*
U.S. Cl. 354—230 **9 Claims**



7. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising:

blade means including at least two blade elements;

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said moving means including a beam member pivotally connecting said blade elements at respective spaced apart points thereon together with means for pivotally connecting said beam member with respect to

the housing at a pivot point on said member intermediate said spaced apart points of pivotal connection to said blade elements so that pivotal movement of said blade member about its point of pivotal connection with respect to the housing operates to drive said blade members in generally opposing directions to define a range of progressively increasing sized apertures as said blades move from said first arrangement to said second arrangement; and

means for presenting a relatively high inertial characteristic to said moving means as said moving means moves said blade means from its said first arrangement towards its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertial characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit an aperture closing movement of said blade means substantially uninhibited by said high inertial characteristic, said inertial characteristic presenting means including an inertia member having at least some portion thereof disposed in intercepting relation with respect to the path of pivotal movement of said beam member together with means for mounting said inertia member to accommodate displacement thereof in correspondence with said pivoting movement of said beam member from a select position with respect to the housing so that said beam member engages said inertia member at said select position as said beam member moves said blade means from its said first arrangement towards its said second arrangement and automatically withdraws from engagement with said inertia member as it moves said blade means away from its said second arrangement towards its said first arrangement, said inertial characteristic presenting means additionally including resilient means for automatically returning said inertia member to its said select position to accommodate the presentation of said relatively high inertial characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement.

3,969,739

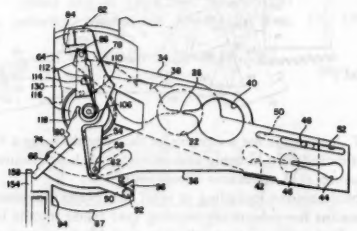
EXPOSURE CONTROL SYSTEM WITH SELECTIVELY PRESENTABLE INERTIA MEMBER

Bruce K. Johnson, Andover; Donald G. Josephson, Medford, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 27, 1975, Ser. No. 581,112

Int. Cl.[2] G03B 9/00, 9/24

U.S. Cl. 354—230 **19 Claims**



1. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising:

blade means;

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said blade means serving to define a range of progressively increasing sized apertures as it moves its said first arrangement to its said second arrangement;

means for presenting a relatively high inertia characteristic to said moving means as said moving means moves said blade means from its said first arrangement toward its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertia characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit aperture closing movement of said blade means substantially uninhibited by said high inertia characteristic, said inertia characteristic presenting means being operative to automatically present said relatively high inertia characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement, wherein said moving means includes a rotatably mounted member arranged to be rotated in a first direction as said moving means moves said blade means from its said first arrangement to its said second arrangement and to be rotated in the opposing direction as said moving means moves said blade means from its said second arrangement to its said first arrangement, and said inertia characteristic presenting means includes an inertia mass member mounted for rotation in correspondence with said moving means member; and

means for rotatably mounting said moving means member and said inertial member including concentric shaft portions extending respectively from said moving means member and said inertial member, said shaft portions being journalled for rotation with respect to each other, and additionally including support means for journalling only the outside concentric shaft portion for rotation about a select axis with respect to the camera housing.

19. Apparatus for a camera of the type defining a film plane and including a housing and an objective lens mounted on the housing, said apparatus comprising;

blade means

means for selectively moving said blade means between a first arrangement wherein said blade means precludes scene light from reaching the film plane and a second arrangement wherein said blade means defines a maximum aperture size through which scene light may reach the film plane, said blade means serving to define a range of progressively increasing sized apertures as it moves from its said first arrangement to its said second arrangement;

means for presenting a relatively high inertia characteristic to said moving means as said moving means moves said blade means from its said first arrangement toward its said second arrangement to impart a slower aperture opening movement to said blade means than would otherwise occur and for automatically presenting a relatively low inertia characteristic to said moving means as said moving means moves said blade means away from its said second arrangement toward its said first arrangement to permit an aperture closing movement of said blade means substantially uninhibited by said high inertia characteristic, said inertia characteristic presenting means being operative to automatically present said relatively high inertia characteristic to said moving means whenever said moving means is again caused to move said blade means from its said first arrangement to its said second arrangement wherein said moving means includes a displacably mounted member arranged to be displaced in a first direction as said moving means moves said blade means from its said first arrangement to its said second arrangement and to be displaced in a second direction as said

moving means moves said blade means from its said second arrangement to its said first arrangement, and said inertia characteristic presenting means includes an inertial member mounted for displacement from an initial position in correspondence with said first displacably mounted member, and including a portion thereof engageable by said moving means member; and

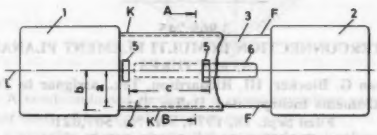
latch means for selective engagement with said inertial member in order to prohibit substantial displacement of said inertial member from said initial position whereby said inertial member can engage said moving means member and retain said moving means member in its position corresponding to said first arrangement in this manner maintaining said blade elements in a position entirely precluding scene light from reaching the film plane regardless of the operative status of said moving means.

3,969,740

FILM CASSETTE

Werner Hahn; Walter Hennig, both of Dresden, and Bernhard Walther, Dessau, all of Germany, assignors to VEB Pentacon-Dresden, Dresden, Germany

Filed Dec. 23, 1974, Ser. No. 535,718
Int. Cl.² G03B *1/22, 17/30*
U.S. Cl. 354—275 **4 Claims**



1. In a film cassette for roll film having transport perforations formed therein; said cassette being suitable for use with cameras having a housing adapted to receive said cassette and a film gate with a film engagement surface therein and film transport mechanism having a drive member engageable with said perforations in said film and performing driving strokes, said cassette comprising:

a. a storage chamber for housing said film:

b. a take-up chamber for receiving said film after exposure:

c. a crosspiece interconnecting said storage and take-up chambers and having a transport surface thereon for guiding said film from the storage chamber to said take-up chamber on the side of the crosspiece nearest the objective lens when the cassette is loaded in the camera; and

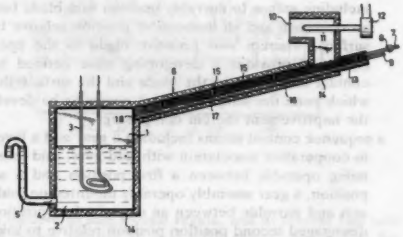
d. a transport slot provided in said crosspiece extending in the film transport direction; said slot passing through the crosspiece and having a length at least equal to the distance between successive transport holes in said film; whereby, when the cassette is located in the camera, said film gate presses said film against the transport surface of said crosspiece, and on transport of said film during a driving stroke of said transport mechanism the drive member extends through the slot and into a perforation.

3,969,741

APPARATUS FOR PRODUCING A DEVELOPER MEDIUM FOR DIAZOTYPE MATERIALS

Hermann Frank, Sulzbach, and Karl-Heinz Degenhardt, Bad Schwalbach, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 7, 1973, Ser. No. 395,152
Claims priority, application Germany, Sept. 9, 1972, 2244384
Int. Cl.² G03D *13/00, 7/00*
U.S. Cl. 354—299 **11 Claims**



1. An apparatus for producing a gaseous developer medium for diazotype materials from a developer solution, which comprises vapor-generating means,

distillation column means arranged above said vapor-generating means and connected thereto,

inlet means on said column means for developer solution to pass counter-currently to vapor from said vapor-generating means, means whereby depleted developer solution flows out of said column means into said vapor-generating means,

outlet means on said vapor-generating means for residual water, and

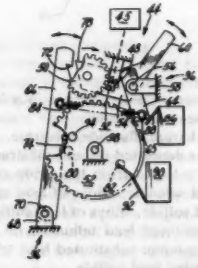
outlet means on said column means for said gaseous developer medium.

3,969,742

AUTOMATIC ENGAGEMENT AND METERING ADJUSTMENT CONTROLS FOR METERING BLADE DEVICE

Peter McCabe, Godalming, England, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Apr. 25, 1974, Ser. No. 464,093
Claims priority, application Belgium, Apr. 24, 1974, 143519
Int. Cl.² G03D *5/06*
U.S. Cl. 354—318 **19 Claims**



1. In a device for developing diazotype sensitized sheets by applying thereto a metered quantity of a developing liquid comprising:

a drive motor;

an applicator roller to be rotatably driven by said motor and having a surface adapted to retain thereon said metered quantity of developing liquid;

liquid supply means for supplying an excess amount of said liquid agent to said roller surface;

wiper blade means for removing excess developing liquid from the roller surface, said wiper blade means including means to movably position the blade between an operative position and an inoperative position relative to said surface;

pressure blade means for pressing said sheets against said applicator roller to transfer the metered amount of liquid from said roller to the sheets, said pressure blade means including means to movably position said blade between an operative and an inoperative position relative to said surface, wherein said pressure blade in the operative condition provides a developing zone defined by the contact area between the blade and the surface through which zone the sensitized sheet passes to be developed; the improvement therein comprising:

a sequence control means including a gear and a lever arm in cooperative association with said gear, said lever arm being operable between a first position and a second position, a gear assembly operably mounted on said lever arm and movable between an engaged first position and disengaged second position position relative to said gear forming a mechanical interconnection between said drive motor and said gear to move said blades into their respective positions latching means;

said latching means latching the sequence control means in said first position to said gear assembly and in said second position rendering said gear assembly free to rotate relative to said sequence control.

3,969,743

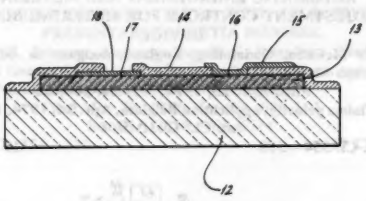
PROTECTIVE COATING FOR IV-VI COMPOUND SEMICONDUCTOR DEVICES

Daniel A. Gorski, Dearborn Heights, Mich., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Apr. 23, 1975, Ser. No. 570,632

Int. Cl.² H01L *29/12*

U.S. Cl. 357—4 **6 Claims**



1. A semiconductor device for use in a low temperature, moistureless ambient comprising:

a single crystal barium fluoride substrate,

a semiconductor deposited on said substrate, said semiconductor being selected from the group consisting of lead telluride, lead selenide, alloys of lead telluride and lead selenide, lead sulfide, alloys of lead sulfide and lead selenide, tin substituted lead telluride, tin substituted lead selenide, germanium substituted lead telluride, and cadmium substituted lead suffide,

means for making electrical contact to selected areas of said semiconductor, and

a protective coating covering said semiconductor, said coating being selected from the group consisting of barium fluoride and strontium fluoride.

3,969,744

SEMICONDUCTOR DEVICES

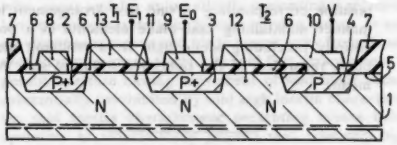
Keith Harlow Nicholas, Reigate, and Ronald Alfred Ford, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,738

Claims priority, application United Kingdom, July 27, 1971, 35122/71

Int. Cl.² H01L *29/80, 29/78, 7/00, 27/02*

U.S. Cl. 357—22 **12 Claims**



1. A semiconductor device comprising a common semiconductor wafer having a body portion of one type conductivity containing at least three spaced surface regions of the opposite type conductivity forming at least two field effect transistors each including a surface channel portion, and means for selectively reducing the gain of one of the field effect transistors, said gain reducing means comprising implanted neutral ions and associated semiconductor crystal lattice damage in the channel portion of said one transistor reducing the effective mobility of charge carriers therein in comparision with the mobility that would have existed in the absence of said implanted ions.

3,969,745

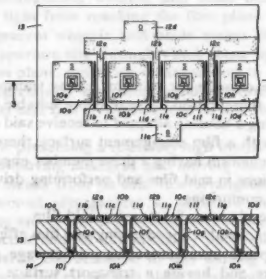
INTERCONNECTION IN MULTI ELEMENT PLANAR STRUCTURES

Truman G. Blocker, III, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 18, 1974, Ser. No. 507,021

Int. Cl.² H01L *29/80, 29/06, 23/48, 29/46*

U.S. Cl. 357—22 **15 Claims**



1. A field effect transistor comprising:

substrate means including a body of semiconductor material having an active region forming one surface thereof,

source, drain and gate electrodes disposed in spaced relationship to each other on said one surface of said semiconductor body with said gate electrode being interposed between said source and drain electrodes,

at least one of said source and drain electrodes being a multi-electrode array including a plurality of electrodes arranged in spaced relation to each other on said one surface of said semiconductor body,

said substrate means including a common conductor located in remote insulated relation to said one surface of said semiconductor body, and

conductive connections between each of said plurality of electrodes included in said array and said common conductor, said conductive connections extending through said active region and at least partially through the remainder of said semiconductor body to electrically connect each of said plurality of electrodes included in said array to said common conductor.

3,969,746

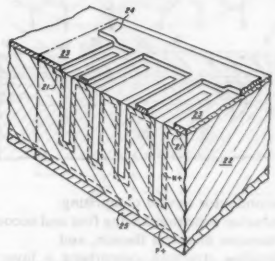
VERTICAL MULTIJUNCTION SOLAR CELL

Don Leslie Kendall, Richardson; Francois Antoine Padovani, Dallas; Kenneth Elwood Bean, and Walter Theodore Matzen, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 10, 1973, Ser. No. 423,630

Int. Cl.² H01L *29/04, 31/06, 21/20, 21/308*

U.S. Cl. 357—30 **5 Claims**



1. A semiconductor device in a monocrystalline semiconductor body of one conductivity type;

a. a plurality of spaced parallel semiconductor columns of one conductivity type, each having a thickness about 10 microns, extending out from said body; and separated by grooves having a depth of about 100 microns;

b. a continuous semiconductor region of opposite conductivity type in said columns, adjacent the surfaces thereof and in said body between said columns to form a continuous PN junction; and

c. a pattern of metal contacts on the top surface of said columns and on the opposite surface of said body.

3,969,747

COMPLEMENTARY BIPOLAR TRANSISTORS WITH IIL TYPE COMMON BASE DRIVERS

Tadaharu Tsuyuki, Isehara; Hajime Yagi, Tokyo, and Toshiro Kobayashi, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

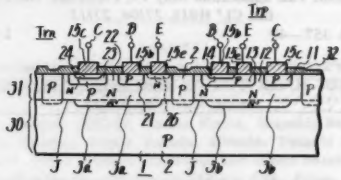
Filed June 10, 1974, Ser. No. 477,786

Claims priority, application Japan, June 13, 1973, 48-66488

Int. Cl.² H01L *27/04*

U.S. Cl. 357—44 **6 Claims**

1. A semiconductor device including a pair of complementary transistors comprising a planar substrate of a first conductivity type, first and second regions of opposite conductivity type formed in said substrate from a first surface and separated laterally from each other, third and fourth regions of said first conductivity type formed in said first region, fifth and sixth regions of said first conductivity type formed in said second region, a seventh region of opposite conductivity type formed in said third region, an eighth region of opposite conductivity type formed in said fifth region, a first collector electrode connected to said seventh region, a first base electrode connected to said fourth region, a first emitter electrode connected to said first region, a second base electrode connected to said eighth region, a second emitter electrode connected to said fifth region, a second collector electrode connected to said sixth region, and means for applying a bias potential to said second emitter electrode and to said second collector electrode of such polarity to forward bias the fifth region relative to said second region, and to reverse bias said second region relative to said sixth region, and means for applying a bias potential to said second base electrode and to said second collector of such polarity to forward bias said eighth region relative to said fifth region.



3,969,748

INTEGRATED MULTIPLE TRANSISTORS WITH DIFFERENT CURRENT GAINS

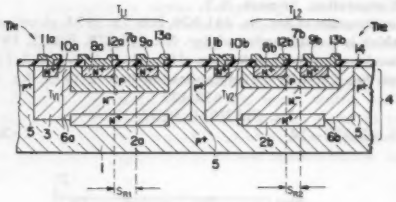
Noboru Horie, Kodaira, and Kazuo Hoya, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 31, 1974, Ser. No. 475,179

Claims priority, application Japan, June 1, 1973, 48-60880

Int. Cl.² H01L *27/02, 27/04, 29/72*

U.S. Cl. 357—46 **6 Claims**



1. An integrated circuit comprising:

a first multiple transistor and a second multiple transistor, which are formed in the same semiconductor body, each of which multiple transistors comprises:

a vertical transistor having a collector region of a first conductivity type, a base region of a second conductivity type formed in said collector region, and an emitter region of the first conductivity type formed in said base region; and

a lateral transistor having a base region of the second conductivity type, and an emitter region and a collector region of the first conductivity type laterally disposed in the surface of said base region, the base region of said lateral transistor being connected to the collector region of said lateral transistor and to the base region of said vertical transistor, the emitter region of said lateral transistor being connected to the emitter region of the vertical transistor; and wherein

the lateral transistors of said first and second multiple transistors have respectively different current amplification factors.

3,969,749

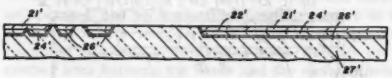
SUBSTRATE FOR DIELECTRIC ISOLATED INTEGRATED CIRCUIT WITH V-ETCHED DEPTH GROOVES FOR LAPPING GUIDE

Kenneth E. Bean, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 456,507, April 1, 1974, abandoned, which is a division of Ser. No. 788,167, Dec. 31, 1968, Pat. No. 3,844,858. This application May 19, 1975, Ser. No. 578,451

Int. Cl.² H01L 27/04, 27/12

U.S. Cl. 357—49 2 Claims



1. A semiconductor substrate to be used in the fabrication of functional semiconductor devices comprising:

a single crystal slice of semiconductor material having a surface oriented in a crystallographic plane, and a plurality of sets of slots of precisely determined, different depths formed in said surface, said slots having at least two sides bounded by crystallographic planes, said slots being spaced apart from major slot-free areas of said surface reserved for the location of functional devices to be fabricated; said sets having locations distributed about the surface of said slice to form a pattern useful for thickness control when the back of the slice is lapped; and

a supporting layer covering said slotted surface, wherein each set of slots includes three slots of different depths, one of said three slots being located between the other two and having an intermediate depth with respect to the other two.

3,969,750

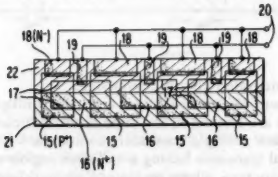
DIFFUSED JUNCTION CAPACITOR AND PROCESS FOR PRODUCING THE SAME

Vir A. Dhaka, and Walter F. Krolikowski, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 441,920, Feb. 12, 1974, abandoned, which is a continuation of Ser. No. 329,278, Feb. 2, 1973, abandoned, which is a division of Ser. No. 1,672, Jan. 9, 1970, Pat. No. 3,734,787. This application Dec. 3, 1975, Ser. No. 637,427

Int. Cl.² H01L 29/93, 27/04

U.S. Cl. 357—14 2 Claims



1. A junction capacitor exhibiting a very high capacitance per unit area and a low series resistance comprising:

a monocrystalline silicon semiconductor substrate of a first conductivity type;

a monocrystalline silicon semiconductor layer of a second conductivity type disposed atop said substrate;

a set of parallel, spaced-apart, highly doped zones of said first conductivity type disposed in said substrate and said layer and remote from the surface of said layer;

a set of parallel, spaced-apart, highly doped zones of said second conductivity type disposed within said substrate and said layer and remote from the surface of said layer;

each one of second conductivity-type zones being disposed completely within adjacent ones of said first-conductivity-type zones but for a contact area between said adjacent zones;

a set of contacts of said second conductivity type from the surface of said layer to said contact areas;

a set of contacts of said first conductivity type from the surface of said layer to said first conductivity type zones; and

first and second means for respectively connecting said first conductivity type contacts and said second conductivity type contacts.

3,969,751

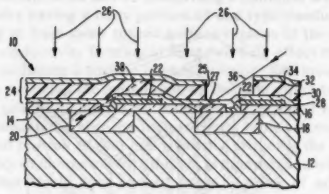
LIGHT SHIELD FOR A SEMICONDUCTOR DEVICE COMPRISING BLACKENED PHOTORESIST

Israel Drukaroff, Lakewood, and Wally Morren, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,995

Int. Cl.² H01L 27/14, 31/00

U.S. Cl. 357—30 4 Claims



1. A semiconductor device comprising:

a semiconductor substrate having first and second light-sensitive elements disposed therein, and

a light-shielding structure comprising a layer of opaque material, disposed above a surface of said substrate and having a window therein adjacent to said first lightsensitive element, said window exposing said first lightsensitive element to light incident upon said device and said light-shielding structure shielding said second lightsensitive element from said incident light, said opaque layer being blackened photoresist having the property of absorbing substantially all light striking a surface thereof.

3,969,752

HYBRID TRANSISTOR

John R. Martin, and Vahan Garboushian, both of Torrance, Calif., assignors to Power Hybrids, Inc., Torrance, Calif.

Continuation of Ser. No. 420,763, Dec. 3, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,624

Int. Cl.² H01L 27/02, 23/48, 39/02

U.S. Cl. 357—51 20 Claims

1. A transistor package for providing in an output circuit a low reactance and a high resistance within a range of operating frequencies to enhance the power output from the transistor package in the range of operating frequencies, including:

a body member providing structural support for the transistor package;

an insulating member disposed on the body member;

at least a pair of thin metallic layers disposed on the body member in an electrically insulated relationship with the body member and in electrically insulated and spaced relationship with one another on the body member;

a transistor die disposed on the insulating member and including at least one transistor cell disposed on the body member in electrically isolated relationship with the metallic layers and defining a plurality of different electrodes in the cell;

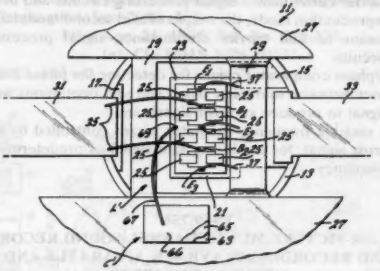
first means providing electrical connections between individual ones of the metallic layers and individual ones of the electrodes in the cell to provide for input connections to the transistor cell;

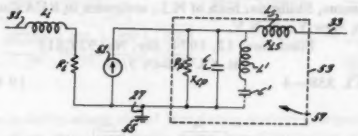
the transistor die and the metallic layers being constructed to provide in an equivalent output circuit of the transistor

package characteristics including a shunt capacitance and a series inductance;

second means formed on the insulating member to define a capacitive reactance; and

third means supported on the insulating member to define an inductive reactance and connected electrically to the second means to provide a series circuit with the second means and a parallel relationship between the series circuit and the shunt capacitance and a series circuit





between the parallel relationship and the series inductance,

the second and third means being provided with values to define an inductive reactance in their series relationship and the inductive reactance to provide a resonance with the shunt capacitance at a particular frequency within the operating range of frequencies to increase the output impedance of the transistor package and the effective range of operating frequencies.

3,969,753

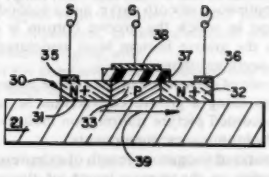
SILICON ON SAPPHIRE ORIENTED FOR MAXIMUM MOBILITY

Arthur C. Thorsen, Jr., Orange County, and Arlen J. Hughes, Tustin, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed June 30, 1972, Ser. No. 267,864

Int. Cl.[2] H01L *27/12*

U.S. Cl. 357—60 **1 Claim**



1. A semiconductor device comprising:

insulating substrate means having a prescribed crystallographic orientation in which an exposed surface displays an anisotropic thermal expansion,

a layer of piezoresistive semiconductive material epitaxially deposited on said exposed surface of said insulating substrate in a preferred crystallographic orientation so that said layer is maintained in an anisotropically stressed condition by said substrate means and exhibits a changed average mobility and a preferred direction of mobility of charge carriers therein, and

at least one region of semiconductor material of said device being located in said layer and oriented so that current passes therethrough in the preferred direction of mobility established in said layer,

wherein the substrate is sapphire and has its (1122) plane exposed and said semiconductor film has its (221) crystallographic face exposed.

3,969,754

SEMICONDUCTOR DEVICE HAVING SUPPORTING ELECTRODE COMPOSITE STRUCTURE OF METAL CONTAINING FIBERS

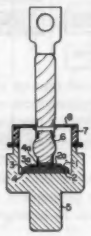
Keiichi Kuniya, Hitachi; Tomio Iizuka, Ibaraki; Masateru Suwa, Hitachi; Tomio Yasuda, Hitachi; Takeshi Sasaki, Hitachi; Sakae Kikuchi, Takasaki, and Hideo Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1974, Ser. No. 516,509

Claims priority, application Japan, Oct. 22, 1973, 48-119307

Int. Cl.[2] H01L *23/48, 29/40, 29/46, 29/62*

U.S. Cl. 357—65 **19 Claims**



1. A semiconductor device comprising a semiconductor substrate and a supporting electrode disposed in area contact on at least one surface of said semiconductor substrate, wherein said supporting electrode comprises a composite structure including a matrix of a metal and a plurality of fibers embedded in said metal matrix, said metal matrix having electric and heat conductivities higher than those of said fibers, said fibers having a coefficient of thermal expansion at most substantially equal to that of said semiconductor substrate.

3,969,755

EQUIPMENT FOR RECORDING AND REPRODUCING COLOR TELEVISION SIGNAL

Ichiro Arimura, Kyoto; Hiroshi Taniguchi, Hirakata, and Chojuro Yamamitsu, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 7, 1974, Ser. No. 512,206

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—4 **9 Claims**

1. An equipment for recording and reproducing color television signals comprising

a. a tuner for selecting any receiving channel desired,

b. a first detector means for detecting the color television signal which has been converted into an intermediate frequency signal by said tuner,

c. luminance signal processing circuits for separating the luminance signal from the detected color video signal and for processing said separated luminance signal,

d. chrominance signal processing circuits for separating the carrier chrominance signal from said detected color video signal and processing said separated carrier chrominance signal;

e. a continuous-wave signal generator circuit for producing a continuous wave signal in phase synchronizm with the burst signal in said carrier chrominance signal,

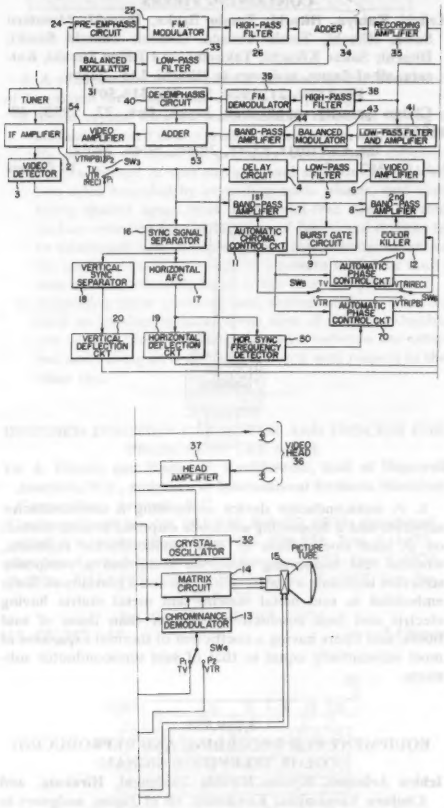
f. a second detector means for phase detecting said carrier chrominance signal with said continuous wave signal;

g. a matrix circuit to which is applied the output from said second detector means and the output from said luminance signal processing circuits,

h. a picture tube for displaying the picture from the outputs from said matrix circuit,

i. means for extracting the luminance signal from said luminance signal processing circuits and for frequency modulating said extracted luminance signal,

j. a stable oscillator and a first modulator means for extracting the carrier chrominance signal from said carrier chrominance signal processing circuits and for heterodyning the extracted carrier chrominance signal with the output of a stable oscillator to convert the carrier chrominance signal into a low-frequency chrominance signal,



k. means for recording and reproducing the color television signal by combining said frequency-modulated luminance signal with said low-frequency chrominance signal,

l. separator means for separating said frequency modulated luminance signal and said low-frequency chrominance signal from the reproduced a signal output of said recording-reproducing means,

m. a third detector means (39) for frequency demodulating said separated frequency modulated luminance signal,

n. a second modulator means (51) for reconverting said separated low-frequency chrominance signal into the carrier chrominance signal with the initial frequency band, by the aid of the signal of a predetermined frequency,

o. a first connecting means for connecting, in the recording mode, the output of said first detector means to said luminance signal processing circuit and in the reproduction mode, the output of said third detector means to said luminance signal processing circuits,

p. a second connecting means for connecting, in the recording mode, the output of said first detector means to said carrier chrominance signal processing circuits and in the reproduction mode, the output of said second modulation means to said carrier chrominance signal processing circuits,

q. a phase comparator means for detecting the phase difference between said burst signal and said continuous wave signal to produce an error signal, and

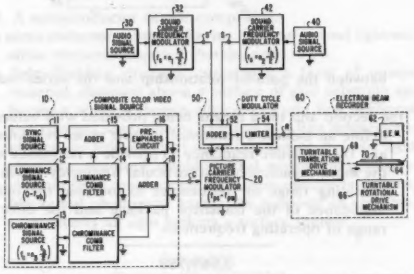
r. a variable frequency oscillator means controlled by said error signal, for producing said signal of predetermined frequency.

3,969,756

COLOR-PICTURE/MULTICHANNEL-SOUND RECORD AND RECORDING/PLAYBACK APPARATUS AND METHODS THEREFOR

Richard Claxton Palmer, Blawenburg, and Jon Kaufmann Clemens, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1974, Ser. No. 522,811
Int. Cl.² H04N *5/82*
U.S. Cl. 358—4 **19 Claims**



1. A color-picture/multichannel sound record comprising:

a disc having a spiral groove in a surface thereof, said groove containing an information track comprising variations in the geometry of the groove bottom along a plurality of convolutions of said spiral groove;

said groove bottom geometry variations comprising alternations between a first cross-sectional shape for the groove in which the groove bottom and adjacent groove walls define a continuous smooth curve, and a second crosssectional shape in which the groove bottom is depressed relative to the groove bottom level associated with the first cross-sectional shape;

wherein the rate of recurrence of the groove bottom depressions varies along a groove convolution in accordance with the recorded picture information inclusive of luminance and chrominance components;

wherein the ratio of the groove length of a depressed groove bottom region to the groove length of the succeeding non-depressed groove bottom region varies along a groove convolution in accordance with the sum of first and second cyclical variations of respectively different rates; the rate of said first cyclical variations being subject to variation in accordance with the first aspect of the recorded second information, and the rate of said second cyclical variation being subject to variation in accordance

with a second aspect of the recorded sound information; and

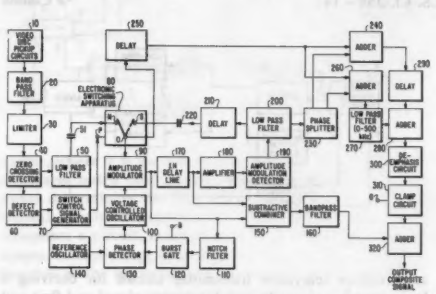
wherein the respective rates of said first and second cyclical variations lie below the lowest frequency of said chrominance component but above half said lowest chrominance component frequency.

3,969,757

COLOR IMAGE SIGNAL PROCESSING CIRCUITS

John Gordon Amery, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,325
Int. Cl.² H04N 5/76, 9/535
U.S. Cl. 358—4 4 Claims



1. In a color image signal translating system comprising a source of an input composite video signal including a luminance signal occupying a wide band of frequencies, and a chrominance signal occupying only an intermediate portion of said wide band, the combination comprising:

a voltage controlled oscillator having an output of a frequency determined by a control voltage input;

means for modulating the output of said oscillator with said input composite signal to develop a modulated carrier output having a sideband in which said chrominance signal occupies an intermediate portion;

a 1H delay line;

means for applying said modulated carrier output to the input of said delay line;

first comb filter means responsive to modulated carrier waves derived from both the input and the output of said delay line;

means for deriving a chrominance signal, to the substantial exclusion of luminance signal components, from the output of said first comb filter means;

an amplitude modulation detector coupled to the output of said delay line for developing a delayed composite video signal;

a second comb filter means, response to an input composite video signal from said source and to a delayed composite video signal from said detector, for passing luminance signal components, to the substantial exclusion of said chrominance signal; and

an adder for combining the outputs of said first and second comb filter means.

3,969,758

SYNCHRONIZING SYSTEM FOR VIDEO RECORDERS

Bernard J. Okey, Sunnyvale, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 4, 1974, Ser. No. 512,364
Int. Cl.² H04N 5/76, 9/44; H04L 7/00
U.S. Cl. 358—8 12 Claims

1. A synchronizing arrangement for use in a color video recorder system comprising:

apparatus for providing an incoming composite video signal,

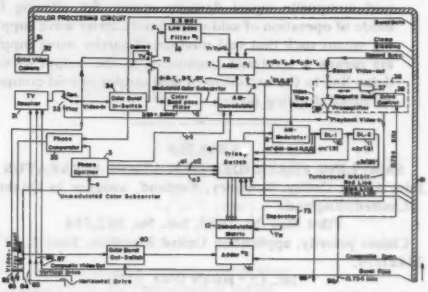
means for separating the color burst from said incoming video signal,

a first oscillator,

means for deriving from said first oscillator an unmodulated color subcarrier,

a phase-locked loop for said first oscillator, said loop being effective in the recording mode and including means for comparing the phase of said unmodulated color subcarrier with the phase of said separator color burst,

means for deriving from said first oscillator a motor reference for said recorder, whereby said motor reference is locked to said color burst,



a second oscillator,

a sync generator driven by said second oscillator and developing a sync pattern comprising a plurality of different series of repetitive pulses,

means for separating the horizontal sync signal from said incoming video signal,

a phase-locked loop for said second oscillator, said loop including means for comparing the phase of one of said pulse series with the phase of said separated sync signal, and

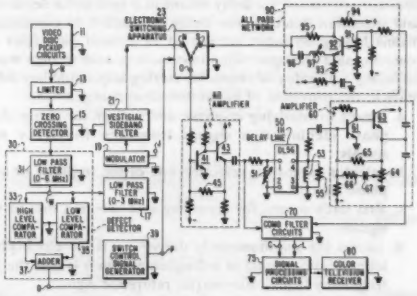
apparatus for processing said video signal prior to recording, said apparatus including means controlled by others of said pulse series for impressing regenerated sync information on the video signal to be recorded.

3,969,759

DEFECT COMPENSATION SYSTEMS

John Gordon Amery, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 476,839, June 6, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 568,313
Int. Cl.² H04N 9/02, 9/535
U.S. Cl. 358—8 16 Claims



11. In a system for playback of a record of successive color images, said system including means for deriving during said record playback a color image representative composite video signal including a luminance signal, and a modulated color

subcarrier forming a chrominance signal having frequencies interleaved with the frequencies of a portion of said luminance signal; the combination comprising:

a 1H delay line having an input and an output;

means for supplying amplitude modulated carrier waves to the input of said delay line, said modulated carrier wave supplying means being normally responsive to an output of said signal deriving means;

means for utilizing said delay line to effect comb filter separation of said luminance and chrominance signals under normal conditions of operation of said composite signal deriving means; and

means responsive to abnormal conditions of operation of said composite signal deriving means for altering the mode of operation of said modulated carrier wave supplying means such that said modulated carrier wave supplying means is rendered responsive to the output of said delay line to the exclusion of said output of said composite signal deriving means.

3,969,760

SAMPLING PHASE IDENTIFICATION APPARATUS

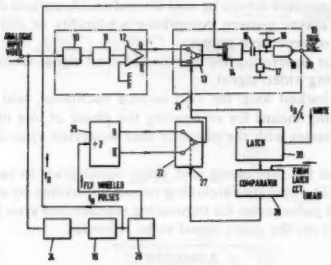
John Albert Coffey, Newbury, England, assignor to Quantel, Limited, England

Filed May 30, 1975, Ser. No. 582,514

Claims priority, application United Kingdom, June 3, 1974, 24421/74

Int. Cl.² H04N 9/44, 5/76

U.S. Cl. 358—8 7 Claims



1. In a digital timebase corrector having a triggered oscillator for driving an analogue-to-digital converter for receiving and converting analogue video information to digital form, control means for writing digital information from said converter into storage means, and control means for reading said digital information from said storage means, said oscillator being triggered by means of signals received from a transition detector connected via delay means to a sync pulse separator, said transition detector also being connected to comparator means having an input connected to a band pass filter for receiving said analogue video information, said storage means including a plurality of stores for storing sequential line information; the provision of apparatus comprising:

a. means for deriving in-phase and anti-phase Write clock phase identification signals from line frequency sync signals;

b. selector means for selecting one of the in-phase or anti-phase signals;

c. first latch means for receiving said selected one of said signals;

d. means for simultaneously deriving a Read clock phase identification signal at a frequency which is half the line frequency from a sub-carrier reference signal;

e. second latch means for receiving the Read clock phase identification signal;

f. comparator means for comparing the output signals from the first and second latch means to produce a Write clock phase identification control pulse so as to select the other of the in-phase and anti-phase Write clock phase identification signals in said selector means when the states of the signals applied to the comparator means are dissimilar.

3,969,761

TRANSMITTER AND RECEIVER CIRCUITS FOR THE SEQUENTIAL STORAGE COLOR TELEVISION SYSTEM

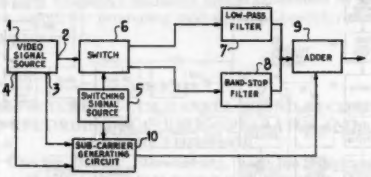
Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 22, 1975, Ser. No. 598,162

Claims priority, application France, July 26, 1974, 74.26060

Int. Cl.² H01L 9/40

U.S. Cl. 358—14 2 Claims



1. A colour television transmitter circuit for deriving a colour television signal from a luminance signal and first and second colour signals, said circuit comprising:

switching and filtering means for alternately substantially eliminating from said luminance signal (i) the components thereof lying in a first channel (ii) the components thereof lying in a second channel, said first and second channels being adjacent channels occupying the upper portion of the frequency band allotted to said colour television signal, the alternation occurring at the line frequency;

subcarrier generating means for alternately delivering (i) a first subcarrier modulated by said first colour signal and (ii) a second subcarrier modulated by said second colour signal, at least a substantial portion of the frequency spectrum of said first subcarrier lying in said first channel, and a second subcarrier modulated by said second colour signal, at least a substantial portion of the frequency spectrum of said second subcarrier lying in said second channel, the alternation occurring at the line frequency so that said first or second subcarrier is delivered by said subcarrier generating circuit according to whether said switching and filtering means substantially eliminate those components of the luminance signal which lie in said first channel or in said second channel; and

adding means for adding the output luminance signal from said switching and filtering means to the output subcarrier from said subcarrier generating circuit.

3,969,762

SECAM COLOR TELEVISION RECEIVERS EMPLOYING TUNABLE NOTCH FILTER IN LUMINANCE CHANNEL

Michel Favreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed July 22, 1975, Ser. No. 598,161

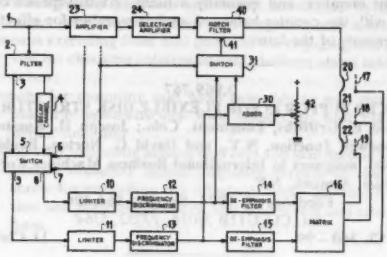
Claims priority, application France, July 26, 1974, 74.26059

Int. Cl.² H04N 9/40

U.S. Cl. 358—38 4 Claims

1. A colour television receiver for operating in a system where the colour television signal comprises a luminance signal and a subcarrier which is alternately frequency modulated by first and second colour signals, the alternation occurring at the line frequency, said receiver comprising a lumi-

nance channel including a notch filter for attenuating the subcarrier, and a colour channel, including delay means, switching means and frequency demodulating means, for simultaneously delivering the colour signal derived from the color television signal being received and the colour signal derived from the colour television signal received at a time T



earlier, where T is the line period, wherein said notch filter is a variable notch filter having a control input for receiving a signal determining the frequency at which said notch filter imparts maximum attenuation, and wherein said receiver comprises a circuit, coupled to said frequency demodulating means, for delivering to said control input a signal which is a function of the instantaneous frequency of said subcarrier.

3,969,763

COLOR TELEVISION CAMERA PROVIDED WITH A PICK-UP DEVICE AND A COLOR FILTER PLACED IN FRONT THEREOF

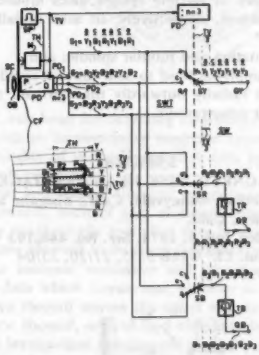
Sing Liong Tan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,940

Claims priority, application Netherlands, Jan. 24, 1973, 7300970

Int. Cl.² H04N 9/22

U.S. Cl. 358—42 **11 Claims**



1. A color television camera comprising a color filter including a plurality of movable strip means having different chromatic transmission characteristics for separating incident light into different colors; a pickup device disposed behind said color filter having a plurality of read strips, a read means for simultaneously reading said read strips, and a plurality of output means for providing sequential output signal of successively different colors corresponding to said filter strips; switching and delay circuit converter means coupled to said pickup device outputs and having output means for providing simultaneous signals of different colors corresponding to the same read strip at any one instant of time; and a plurality of camera outputs coupled to said converter outputs respectively.

3,969,764

COLOR TELEVISION CAMERA

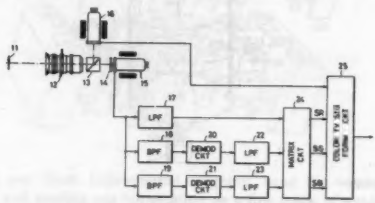
Hideshi Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 24, 1975, Ser. No. 543,929

Claims priority, application Japan, Jan. 28, 1974, 49-11616

Int. Cl.² H04N 9/07

U.S. Cl. 358—47 **5 Claims**



1. A color television camera comprising:

a camera tube for chrominance signal;

a color-resolving striped filter disposed in the optical path of said camera tube, said color-resolving striped filter comprising a plurality of groups of filter stripes, each of said groups comprising a plurality of different kinds of said filter stripes which respectively extend in a specific direction, said stripes being arranged in a predetermined sequence along a line which is perpendicular to the specific direction, and at least two of said filter stripes transmitting two of said primary colors with different spatial frequencies in the specific direction;

means for causing an electron beam in said camera tube to scan simultaneously over the filter stripes in each group in parallel with the specific direction to produce chrominance signals in response to the light of an optical image passing through said striped filter;

low-pass filter means responsive to the chrominance signals for separating direct wave signals representing a sum of first, second and third primary color light signals of a specific ratio;

first band-pass filter means responsive to the chrominance signals for separating a first modulated color signal in which a carrier wave of a first frequency is amplitude-modulated with the second primary color light signal;

second band-pass filter means responsive to the chrominance signals for separating a second modulated color signal in which a carrier wave of a second frequency is amplitude-modulated with the third primary color light signal; and

means for demodulating the first and second modulated color signals and matrixing them with the direct wave signals to derive three primary color signals.

3,969,765

DEVICE FOR THE THERMOMAGNETIC RECORDING OF INFORMATION

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

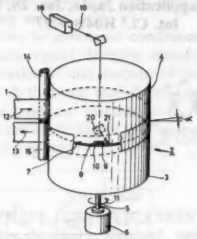
Filed May 20, 1974, Ser. No. 471,547

Int. Cl.² G11B 5/02; H04N 1/28

U.S. Cl. 360—59 **6 Claims**

1. A device for recording information on a magnetizable record medium having a temperature-dependent coercive force and being provided on an elongated carrier, comprising means for moving the carrier, at least one magnetic transducer cooperating with the recording medium for producing a mag-

netic field having a field strength at the area of the recording medium below the coercive force at room temperature thereof, and a heating source to locally heat the recording medium to a temperature above room temperature, the improvement comprising a rotatable cylindrical supporting member around which the record carrier is laid and on the circumference of which the transducer is mounted, the rotatable cylindrical supporting member constituting a means for moving the transducer in a direction which encloses an angle



with the direction of movement of the record carrier, wherein the heating source is a source of radiation arranged independently of the supporting member and producing a concentrated energy beam, means mounted on the supporting member for directing the energy beam onto the record carrier and for focussing the energy beam in a location in front of the transducer viewed in the direction of rotation of the supporting member, whereby the energy beam is moved synchronously with the electro-magnetic transducer

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3,969,766

TENSION CONTROL DEVICE FOR A VIDEO TAPE RECORDING AND/OR REPRODUCING APPARATUS

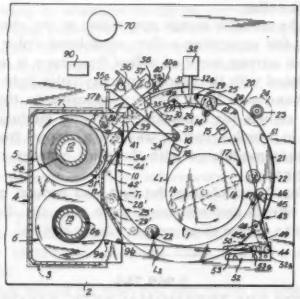
Katsuo Tanaka, Tokyo, and Akira Saito, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,279

Claims priority, application Japan, Nov. 16, 1973, 48-132484[U]

Int. Cl.² G11B *15/66, 15/43, 5/52, 23/04*

U.S. Cl. 360—85 **8 Claims**



1. A tension control device for controlling the tension in a tape as the latter is being advanced from a supply reel to a take-up reel, comprising a movable tension control arm engageable with a run of the tape between said supply and take-up reels, a tensioning spring connected with said arm for urging the latter against the tape so that the positioning of said arm is dependent on the force of said tensioning spring and the tension of said tape run, braking means controllable by said positioning of the tension control arm for resisting rotation of the supply reel with a braking force which maintains a substantially constant tension in said tape run, an anchor member connected with said tensioning spring and being movable for adjusting the force of said tensioning spring and thereby varying said substantially constant tension maintained in said tape run, an additional spring acting on said anchor member in opposition to said tensioning spring for substantially counterbalancing the force of said tensioning spring in respect to said anchor member, and manually actuable control means coupled with the counter-balanced anchor member for effecting movements of the latter.

3,969,767

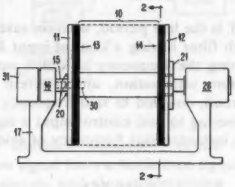
SPACER SUPPORTS FOR FLEXIBLE DISK STRUCTURES

Donald E. Griffiths, Longmont, Colo.; Joseph H. Koestner, Hopewell Junction, N.Y., and David G. Norton, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,406

Int. Cl.² G11B *5/016, 17/32, 5/64*

U.S. Cl. 360—99 **11 Claims**



1. A magnetic storage apparatus comprising:

a laminated tubular spindle consisting of a plurality of coaxially abutting spacer washers mounted for rotation as a unit and including radially extending air passageways, and each of said spacer washers having a radially inward portion of maximum axial extent for abutting engagement with both axially adjacent other ones of said spacer and radial outward portion of lesser axial extent, each washer having a central aperture aligned with apertures from other ones of said washers in said tubular spindle;

a like plurality of flexible record disks mounted to said spacer washers, respectively, in said radially outward portions;

means for rotating said tubular spindle; and

means for supplying fluid to said tubular spindle for fluid movement radially outwardly through said radially extending air passageways.

3,969,768

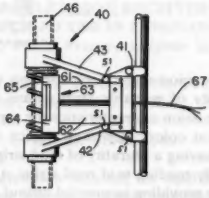
MAGNETIC DISK HEAD CARRIAGE

Peter F. M. Ebbing, Sunnyvale, Calif., assignor to Tri-Data, Mountain View, Calif.

Filed July 5, 1974, Ser. No. 486,193

Int. Cl.² G11B *5/55, 21/20, 25/04*

U.S. Cl. 360—107 **18 Claims**



1. For use in a magnetic disk recording apparatus having a magnetic disk member, a threaded lead screw, a motor for turning said lead screw for indexing a head carriage over the

surface of said disk, and a guide rod for checking twisting of said head carriage about said lead screw, an improved magnetic disk head carriage assembly comprising:

a magnetic disk head assembly;

means forming a receiving platform for receiving said disk head assembly;

a first and a second beam-shaped member extending from said receiving platform, said beam-shaped members being symmetrically located with respect to a center line through said platform and being terminated by a lead screw receiving means for receiving said lead screw;

means extending from said platform for engaging said guide rod for checking rotation of said platform about said lead screw;

means for mounting said head assembly to said receiving platform symmetrically with respect to said platform center line; and

means for resiliently biasing said first and said second beam-shaped members against opposing threads of said lead screw for cancelling the effects of wear, thermal expansion and backlash between said lead screw and said platform.

3,969,769

MAGNETO-RESISTIVE HEAD

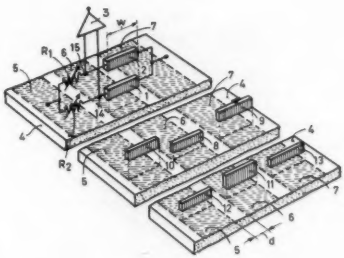
Frederik Willem Gorter, and Jan Antoon Ludolf Potgiesser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1975, Ser. No. 568,994

Claims priority, application Netherlands, Apr. 29, 1974, 05727

Int. Cl.[2] G11B *5/12*

U.S. Cl. 360—113 **5 Claims**



1. A magnetic head for detecting information-representing magnetic fields on an associated magnetic recording medium having a plurality of generally parallel data tracks disposed thereon which comprises:

at least first and second elongate magneto-resistive detection elements, each of said elements being oriented so that any magnetically recorded data in the tracks which causes one element to increase resistance also causes the other to increase resistance and any magnetically recorded data which causes one element to decrease the resistance thereof causes the other also to decrease the resistance thereof, one of said elements being disposed with the longitudinal axis thereof generally perpendicular to the data tracks, each of said elements being disposed with the longitudinal axis thereof parallel to the recording medium and in spaced relationship from each other element to prevent magneto static coupling therebetween;

means for generating an electric potential;

means for connecting said electric potential to each of said elements to generate a signal with each of said elements; and

means for generating an additional signal which is a function of the difference between at least two of said signals.

3,969,770

TWO-TRACK BIDIRECTIONAL CASSETTE HEAD FOR DATA HANDLING APPARATUS

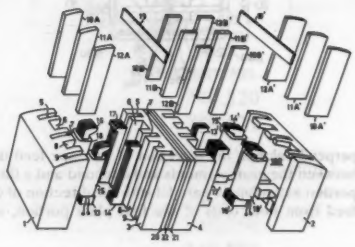
Pier Giuseppe Cavallari, Novara, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Feb. 23, 1973, Ser. No. 335,275

Claims priority, application Italy, Mar. 3, 1972, 21345/72

Int. Cl.[2] G11B *5/27, 5/10*

U.S. Cl. 360—121 **2 Claims**



1. A two track bidirectional magnetic head for writing, erasing and reading out information on a first track of a magnetic support in motion in a first direction with respect to said head, and on a second track parallel to said first track of said magnetic support in motion in a second opposite direction, comprising: a first write-erase transducer and a first read-out transducer for operating on said first track, respectively provided with a first write-erase gap and a first read-out gap, arranged in transverse relationship to said tracks, a second write-erase transducer and a second read-out transducer for operating on said second track, respectively provided with a second write-erase gap and a second read-out gap, arranged in transverse relation to said tracks, and magnetic shields to prevent interaction between said transducers, wherein the shields encompassing each reading transducer are spaced apart by a distance substantially equal to the width of the gap of the write-erase transducer operating on the same track, wherein the first write erase gap is aligned with the second read-out gap, said second write-erase gap is aligned with said first read-out gap, non-magnetic structural means for enclosing and supporting said transducers and said shields, including two mutually identical external supporting members, and two mutually identical internal supporting members arranged symmetrically with respect to a central plane for holding said transducers and said shields in a centrally symmetrical pattern around a central axis contained in said central plane.

3,969,771

MAGNETIC HEAD WITH SHIELD PLATES FOR RESPECTIVE HEAD ELEMENTS

Nobuo Suzuki, Yokosuka, and Takao Ketori, Katsuta, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 23, 1973, Ser. No. 408,259

Claims priority, application Japan, Oct. 25, 1972, 47-122521[U]

Int. Cl. G11b *5/28, 5/10*

U.S. Cl. 360—121 **4 Claims**

1. A magnetic head assembly for recording on and reproducing from a magnetic tape comprising:

a head case;

a first and a second magnetic head element aligned with each other along the direction of the tape feed within said head case,

said first magnetic head element comprising at least one reproducing head core,

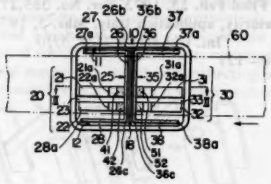
said second magnetic head element comprising at least one recording head core,

said reproducing and recording head cores having respective head gaps provided in parallel with each other and

contacting the same track on the magnetic tape when it runs; and

a first and a second shield plate,

said first shield plate having at least a first plate portion



perpendicular to the direction of the tape feed disposed between the head elements and a second and a third plate portion extending in parallel with the direction of the tape feed from both ends of the first plate portion, so as to enclose the first head element at least in three directions, said first, second and third plate portions of the first shield plate being integrally formed,

said second shield plate having at least a first plate portion perpendicular to the direction of the tape feed disposed between the head elements and a second and a third plate portion extending in parallel with the reverse direction of the tape feed from both ends of the first plate portion so as to enclose the second head element at least in three directions, said first, second and third plate portions of the second shield plate being integrally formed, and wherein

the first plate portions of said shield plates have respective end portions near the surface of the magnetic tape, said end portions extending approximately to the surface of the magnetic tape farther than the head gaps of the magnetic head cores, and a non-magnetic material having the same or substantially the same hardness and coefficient of thermal expansion as those of the magnetic head cores is filled in the space between said end portions and said magnetic head cores so as to form a smooth circular face for contact with the magnetic tape.

DESIGN PATENTS

GRANTED JULY 13, 1976

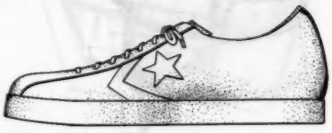
ERRATA

For CLASS	See PATENT NO.
025–056	240,520
025–022	240,521
025–035	240,522
016–030	240,554
016–032	240,555
010–081	240,556
016–032	240,557
086–010 F	240,561

DESIGNS

JULY 13, 1976

240,470
ATHLETIC SHOE
Gilbert Ford, Lynnfield, Mass., assignor to Eltra Corporation, Wilmington, Mass.
Filed Oct. 3, 1974, Ser. No. 511,576
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

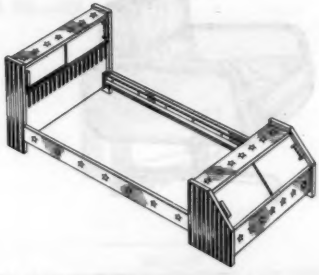


240,471
BOOT HEEL
Robert E. Russell, Holden, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Mar. 21, 1975, Ser. No. 560,808
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—323

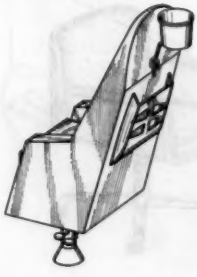
240,472
COMBINED BOOT SOLE AND HEEL
Giuseppe Sironi, Albizzate, Italy, assignor to Vibram S.p.A., Albizzate, Varese, Italy
Filed Apr. 9, 1975, Ser. No. 566,505
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

240,473
BRUSH
Russell H. R. Parker, Cleveland, Ohio, assignor to Superior Brush Company, Cleveland, Ohio
Filed Jan. 20, 1975, Ser. No. 542,599
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—29

240,474
COMBINED BED AND TOY BOX
Michael E. Pawlak, General Delivery, Echo, La. 71330
Filed July 12, 1974, Ser. No. 488,240
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—6



240,475
UTILITY CHAIR FOR A HAIRDRESSER
Jeanette Morgan, 5867 Lotus, St. Louis, Mo. 63112
Filed Sept. 30, 1974, Ser. No. 510,214
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



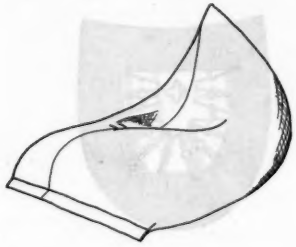
240,476
ARMCHAIR
Rodrigo Rodriquez, Carimate, Como, Italy, assignor to Marcatre S.p.A., Rovellasca, Como, Italy
Filed Jan. 23, 1975, Ser. No. 543,304
Claims priority, application Italy July 26, 1974
Term of patent 14 years
Int. Cl. D6—*31*
U.S. Cl. D6—26

240,477
PEDESTAL LOUNGE CHAIR
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,305
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

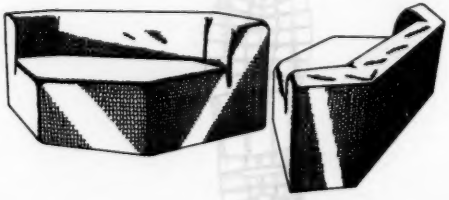
240,478
PEDESTAL ARM CHAIR
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,304
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

240,479
SEAT OR SIMILAR ARTICLE
Matti Halme, Helsinki, Finland, assignor to Burris Industries, Inc., Lincolnton, N.C.
Filed Feb. 13, 1975, Ser. No. 549,520
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

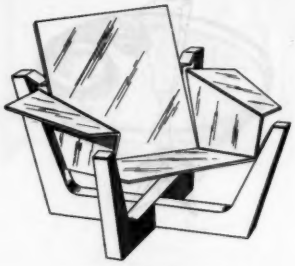
240,480
CHAIR
Robert J. Marks, 210 Johnson Ferry Road, Atlanta, Ga. 30328
Filed Mar. 4, 1975, Ser. No. 555,169
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



240,481
SOFA
Lee Harold Fister, Jr., 7715 Park Creek Drive, Dayton, Ohio 45459
Filed Feb. 10, 1975, Ser. No. 548,233
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—61



240,482
ARMCHAIR
Robert Francis Voorhees, Jr., 375 Church Lane, North Brunswick, N.J. 08902
Filed Jan. 31, 1975, Ser. No. 545,766
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

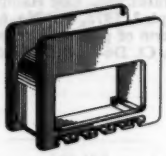


240,483
CHAIR OR SIMILAR ARTICLE
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,302
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

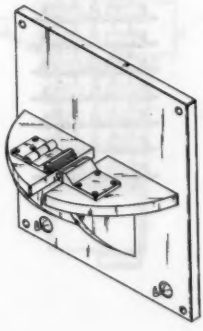
240,484
ARMCHAIR OR SIMILAR ARTICLE
William Sklaroff, Narberth, Pa., assignor to John Stuart International Inc., New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,303
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

240,485
COMBINED MIRROR AND TOOTHBRUSH HOLDER
Stuart A. Farbman, 205 E. Mount Pleasant Ave., Livingston, N.J. 07039
Filed Apr. 17, 1975, Ser. No. 568,948
Term of patent 14 years
Int. Cl. D16— *06;* D23—*02*
U.S. Cl. D6—94

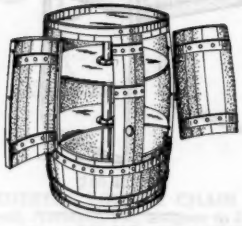
240,486
RACK FOR GARDEN IMPLEMENTS AND HOSES
Dieter Raffler and Franco Clivio, Ulm, Germany, assignors to Kupex AG, Glarus, Switzerland
Filed Mar. 1, 1973, Ser. No. 336,898
Claims priority, application Germany Oct. 14, 1972
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—112



240,487
RACK FOR SKIS AND SKI POLES OR THE LIKE
Ralph A. Blair, 228 N. Atlantic Place, Boise, Idaho 83704
Filed July 30, 1973, Ser. No. 383,630
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—125



240,488
COMBINED BAR AND DISPLAY CABINET
Lawrence D. Taub, 7435 Boulevard East, North Bergen, N.J. 07047
Filed Oct. 21, 1974, Ser. No. 516,785
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—148

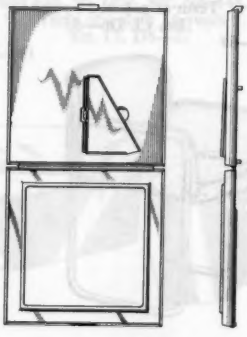


240,489
ROTATABLE DISPLAY STAND
Julian Kerwin, Westfield, Mass., assignor to Creative Display Fixtures, Inc., East Hampton, Mass.
Filed Sept. 2, 1975, Ser. No. 609,407
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—188

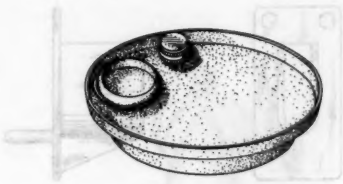
240,490
FLORAL HOLDER BASE
John Kevin Hunt, 10920 S. Rolmar, Oak Lawn, Ill. 60453
Filed Feb. 24, 1975, Ser. No. 552,635
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

240,491
SEAT CUSHION
Milton H. Kramer, Wyncote, Pa., assignor to D S C Industries, Inc., Philadelphia, Pa.
Filed Mar. 5, 1975, Ser. No. 555,685
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

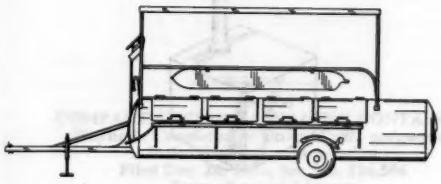
240,492
PHOTO FRAME
Ralph R. Burin, Glen Ellyn, Ill., assignor to Intercraft Industries Corporation
Filed May 5, 1975, Ser. No. 574,540
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



240,493
COMBINED SERVING TRAY AND TUMBLER
Clair O. Musser, 12997 Blairwood Drive, Studio City, Calif. 91604
Filed Aug. 9, 1974, Ser. No. 496,044
Term of patent 7 years
Int. Cl. D7—*99*
U.S. Cl. D7—3



240,494
MOBILE COOKING TRAILER
Kenneth Beasley, 2141 NW. 33rd., Oklahoma City, Okla. 73112
Filed July 15, 1974, Ser. No. 488,675
Term of patent 14 years
Int. Cl. D7—*02;* D12—*10*
U.S. Cl. D7—108

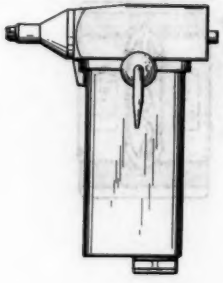


240,495
CUTLERY HANDLE
Rudolf Koppe, 27 Kenninghall Blvd., Streetsville, Ontario, Canada
Filed Oct. 22, 1974, Ser. No. 516,920
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—152

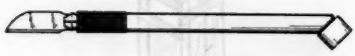
240,496
KNIFE HOLDER
Allan E. Schultz, 12049 Stony Creek, Milan, Mich. 48160, and Stewart Gordon, 1319 S. Forest, Ann Arbor, Mich. 48104
Filed Nov. 4, 1974, Ser. No. 520,561
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74

240,497
CAN OPENER PUNCH
Ferris E. Riba, 3722 E. Milton, Tucson, Ariz. 85706
Filed Sept. 18, 1974, Ser. No. 507,233
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18

240,498
WIRE INSERTER
Carl L. Foltz, Briarhill Lane, Holiday, Fla. 33589; Vernon H. Troutner, 4805 37th St., St. Petersburg, Fla. 33711; and Arthur F. Trott, 3538 Grove St., Clearwater, Fla. 33515
Filed Oct. 29, 1975, Ser. No. 626,822
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68



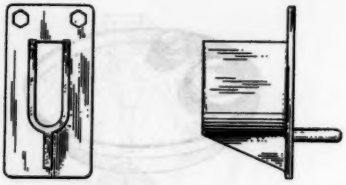
240,499
CUTTING AND ROLLING TOOL
Morris L. Souders, R.R. 1, Box 251, Prairie Drive, Bloomington, Ind. 47401
Filed Feb. 3, 1975, Ser. No. 546,267
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



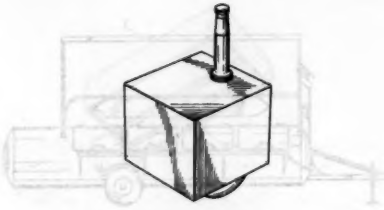
240,500
ADJUSTABLE BLADE KNIFE HANDLE
James L. Richards, Rosemead, Calif., assignor to Pacific Handy Cutter, Inc., Costa Mesa, Calif.
Filed July 2, 1975, Ser. No. 592,547
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

240,501
SIGN CLIP
Richard A. Carroll, North Providence, R.I., assignor to The Lorac Company, Inc.
Filed Apr. 7, 1975, Ser. No. 565,758
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—245

240,502
SHELF END MOUNTING BRACKET
Charles R. Daniels, 256 Sudbury Drive, Atlantis, Fla. 33406
Filed Apr. 21, 1975, Ser. No. 570,252
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—255

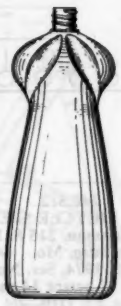


240,503
BLOCK CASTER
Donald C. Crescenzi, Branford, and Eleanor S. Michaud, Nichols, Conn., assignors to Stewart-Warner Corporation, Chicago, Ill.
Filed Dec. 9, 1974, Ser. No. 530,702
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—226

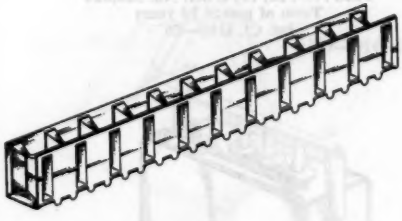


240,504
BOTTLE
Charles S. Hayes, Chicago, Ill., assignor to Charles S. Hayes, Chicago, Ill.
Filed Mar. 15, 1973, Ser. No. 341,507
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—83

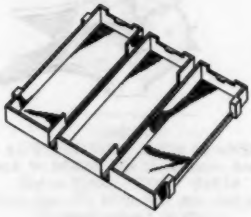
240,505
BOTTLE
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,971
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—90



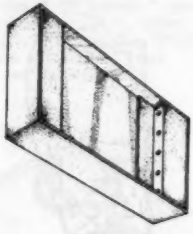
240,506
COMPARTMENTED PACKAGING CONTAINER
Wayne L. Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation
Filed Dec. 26, 1974, Ser. No. 536,506
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184



240,507
PACKAGING TRAY FOR CONTAINING AND DISPENSING RAZOR BLADE UNITS
Christopher J. Hood, Tolworth, England, assignor to Wilkinson Sword Limited
Filed May 20, 1974, Ser. No. 471,205
Claims priority, application Great Britain Nov. 29, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189

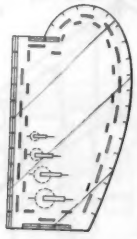


240,508
PACKAGING CONTAINER
Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Company Limited, Sakae-machi, Kameyama, Mie, Japan
Filed Jan. 15, 1975, Ser. No. 541,323
Claims priority, application Japan Sept. 2, 1974
Term of patent 7 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

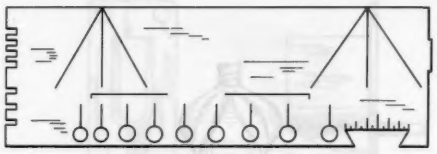


240,509
ACTUATOR CAP FOR A PRESSURIZED CONTAINER
Alvydas Velicka, Watertown, and Walter Makauskas, Prospect, Conn., assignors to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed May 13, 1974, Ser. No. 469,547
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258

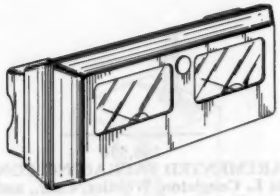
240,510
GARMENT DESIGNING STENCIL
Marie Irene Solange Brien, 45 Hermes Ave., Candiac, Quebec, Canada
Filed May 14, 1974, Ser. No. 469,824
Claims priority, application Canada Mar. 12, 1974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



240,511
CHAIN SAW GAUGE
Elof Granberg, 530 Canal St., San Rafael, Calif. 94901
Filed Jan. 13, 1975, Ser. No. 540,423
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



240,512
ELECTRONIC BICYCLE SPEEDOMETER
David E. Erisman, 515 S. Maguire, Warrensburg, Mo. 64093
Filed Oct. 15, 1974, Ser. No. 514,469
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



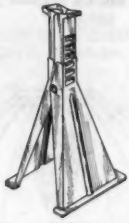
240,513
BURGLAR ALARM
Maxey A. Hankins, Encino, Calif., assignor to Mole-Richardson Co.
Filed Nov. 25, 1974, Ser. No. 526,624
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106

240,514
FOLDABLE EMERGENCY WARNING SIGNAL
Peter E. Brudy, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 17, 1975, Ser. No. 541,847
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

240,515
FOLDABLE EMERGENCY WARNING SIGNAL
Kenneth J. Crompton, Willowdale, Ontario, and Theodore Hochstatter, Etobicoke, Ontario, Canada, assignors to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Jan. 17, 1975, Ser. No. 541,848
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

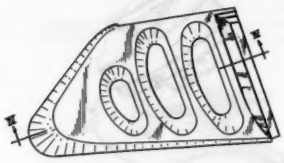
240,516
BUZZER FOR BICYCLES AND THE LIKE
Hisashi Saitou, Kasugai, Japan, assignor to Kabushiki Kaisha Saikosha Seisakusho, Kasugai, Aichi, Japan
Filed Aug. 16, 1974, Ser. No. 498,007
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116

240,517
AUTOMOTIVE JACK STAND
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Apr. 17, 1975, Ser. No. 569,063
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

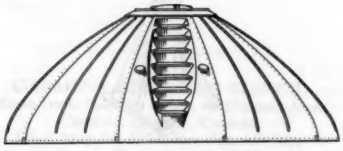


240,518
BABY WALKER
Hajime Ishida, 9–10 Tateishi 7-chome, Katsushika-ku, Tokyo, Japan
Filed July 7, 1975, Ser. No. 593,239
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—130

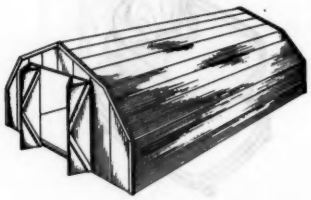
240,519
SET OF AUTOMOBILE LOUVRE ACCESSORIES
Hyman R. Richter and Robert I. Demaray, Hamilton, Ontario, Canada, assignors to Bay-King Motors (1968) Ltd., Hamilton, Ontario, Canada
Filed Aug. 24, 1973, Ser. No. 391,209
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



240,520
SILO DOME
Marion E. Hutchison, 1241 Ackermant St., Waterloo, Iowa 50701; Vernon O. Thomas, R.R. 2, Charles City, Iowa 50616; and William D. Shafar, 405 W. Plum, West Union, Iowa 52175
Filed Feb. 25, 1974, Ser. No. 445,203
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—56

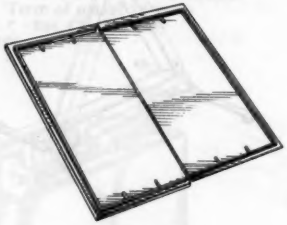


240,521
UTILITY BUILDING OR SIMILAR CONSTRUCTION
James T. Cribben, Mechanicsburg, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed May 21, 1973, Ser. No. 362,020
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



240,522
STATION FOR ELEVATED RAILWAY
Lawrence K. Edwards, 565 Arastradero Road, Palo Alto, Calif. 94306
Filed Oct. 5, 1973, Ser. No. 403,925
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—35

240,523
MENU COVER
Theodor Box, 1108 Aileen Road, Brielle, N.J. 08730
Filed Nov. 5, 1974, Ser. No. 521,078
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

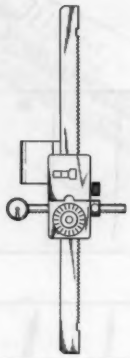


240,524
BALL-POINT PEN
Alain Carre, Paris, France, assignor to Waterman, S.A., Paris, France
Filed June 19, 1974, Ser. No. 480,834
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45

240,525
PEN
Eugene Defores, Nantes, France, assignor to Waterman, S.A., Paris, France
Filed June 19, 1974, Ser. No. 480,694
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

240,526
WRITING INSTRUMENT
Franco Verona, Turin, Italy, assignor to Aurora S.p.A., Turin, Italy
Filed Oct. 24, 1974, Ser. No. 517,719
Claims priority, application Italy May 6, 1974
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

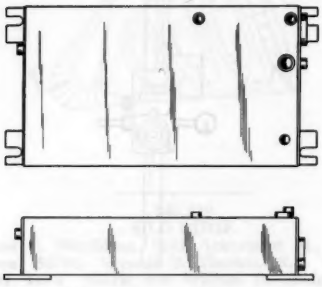
240,527
SIGHT FOR AN ARCHERY BOW
Goro Nishikata, Kawasaki, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan
Filed Aug. 29, 1974, Ser. No. 502,041
Claims priority, application Japan Mar. 8, 1974
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—5



240,528
ARTIFICIAL FISHING LURE
Robert K. Harris, Charlotte, N.C., assignor to Ringley & Crockett, Inc., Charlotte, N.C.
Filed June 24, 1974, Ser. No. 482,457
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

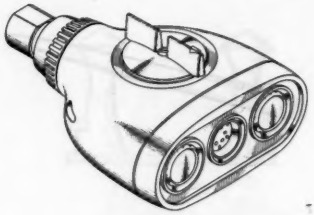
240,529
TARGET MARKER
George Hinson-Rider, 300 Circle Drive, Santa Fe, N. Mex. 87501
Filed July 1, 1974, Ser. No. 484,625
Term of patent 7 years
Int. Cl. D22—*04*
U.S. Cl. D22—99

240,530
FLUID RESERVOIR FOR PUMPS OR THE LIKE
Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010
Filed May 8, 1975, Ser. No. 575,586
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

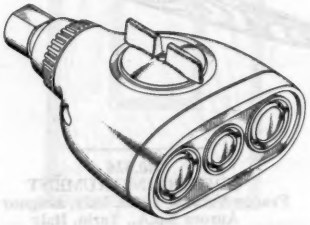


240,531
PORTABLE WATER PURIFIER
Kenneth W. Elkington, Coral Springs, Fla. (6991 Ford Station Road, Germantown, Tenn. 38138)
Filed June 10, 1974, Ser. No. 478,177
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

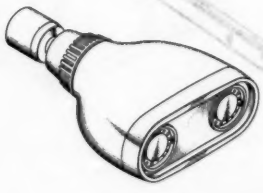
240,532
SHOWER SPRAY HEAD
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed Apr. 9, 1975, Ser. No. 566,445
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



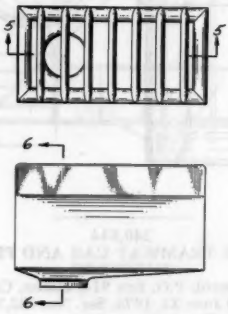
240,533
SHOWER SPRAY HEAD
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed May 19, 1975, Ser. No. 578,497
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



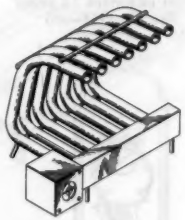
240,534
SHOWER SPRAY HEAD
Milton Halsted, Long Beach, and Tim M. Uyeda, South San Gabriel, Calif., assignors to Chicago Specialty Manufacturing Company, Skokie, Ill.
Filed July 10, 1975, Ser. No. 589,861
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



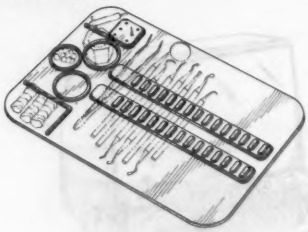
240,535
FLOOR TOILET OR THE LIKE
Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering, City of Industry, Calif.
Filed Mar. 10, 1975, Ser. No. 557,022
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67



240,536
COMBINED AIR CONVECTOR AND LOG SUPPORT FOR FIREPLACES
Reuben L. Christophel, Harrisonburg, Va., assignor to Shenandoah Manufacturing Company, Inc.
Filed June 5, 1975, Ser. No. 584,022
Term of patent 14 years
Int. Cl. D7—*08;* D23—*03*
U.S. Cl. D23—94

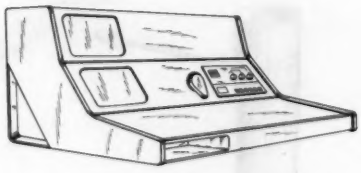


240,537
TRAY FOR HOLDING DENTAL EQUIPMENT AND SUPPLIES
Robert M. Sronce, Lake Isabella, Calif., assignor to Johnson Pet-Dor, Inc., d.b.a. J & S Products
Filed Mar. 21, 1975, Ser. No. 560,673
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 R



240,538
IGNITION INDUCTION COUPLER FOR INTERNAL COMBUSTION ENGINE OR THE LIKE
Delbert N. Wall, Box 848, Burlington, Colo. 80807
Filed Feb. 21, 1974, Ser. No. 444,471
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R

240,539
AUDIO VISUAL CONTROL
Erle B. Savage, Jr., 2406 Woodwinds Lane, Wayzata, Minn. 55391
Filed Nov. 18, 1974, Ser. No. 524,983
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

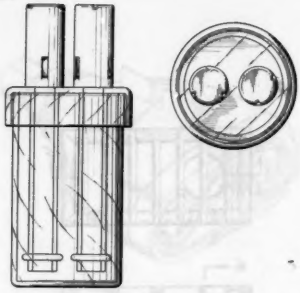


240,540
COMPUTER TERMINAL
Ronald E. Loosen, Malibu, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 11, 1974, Ser. No. 531,847
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

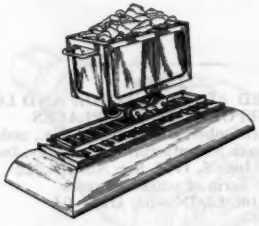
240,541
CIGARETTE
John P. Rupert, Stellenbosch, Cape Province, Republic of South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland
Continuation of design application Ser. No. 252,958, May 12, 1972. This application Mar. 5, 1974, Ser. No. 448,232
Claims priority, application Republic of South Africa Mar. 14, 1972
Term of patent 14 years
Int. Cl. D27—*01*
U.S. Cl. D27—1

240,542
SMOKING PIPE
Joseph E. Murray, Jr., 27 Alpine St., Malden, Mass. 02148
Filed Jan. 15, 1975, Ser. No. 541,289
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

240,543
CELL CULTURE VESSEL OR THE LIKE
Robert Dragotta, Vineland, N.J., assignor to Bio-Research Glass, Inc., Vineland, N.J.
Filed Oct. 2, 1974, Ser. No. 511,188
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R

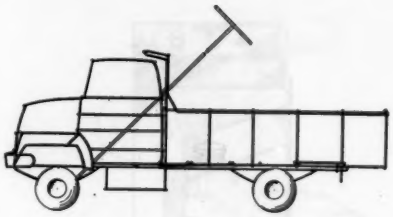


240,544
MINIATURE TRAMWAY CAR AND PLATFORM THEREFOR
Harold J. Howard, P.O. Box 914, Dillon, Colo. 80435
Filed June 24, 1974, Ser. No. 482,758
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM

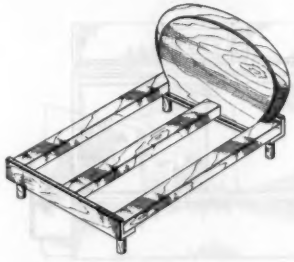


240,545
BANK
Sadayasu Miyazaki, 7–9–10 Tateishi, Katsushika-ku, Tokyo, Japan
Filed Jan. 6, 1975, Ser. No. 538,864
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

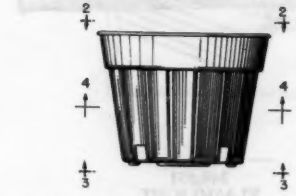
240,546
TOY AUTOMOTIVE VEHICLE
Marouf Nashagh, 335 Hawthorne Ave., Hawthorne, N.J. 07506
Filed Feb. 22, 1974, Ser. No. 444,755
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



240,547
TOY BED
Bliss W. Stanley and Edmee M. Stanley, both of 1137 N. Overlook Ridge Road, Diamond Bar, Calif. 91765
Filed Dec. 9, 1974, Ser. No. 530,524
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC

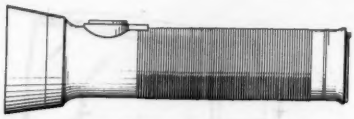


240,548
PLANT CONTAINER
Darrell E. Messick, Sunnyvale, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.
Filed Apr. 17, 1975, Ser. No. 569,281
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

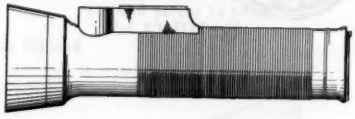


240,549
LIGHTING FIXTURE
Zia Eftekhar, Glendale, Calif., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed June 20, 1975, Ser. No. 588,803
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

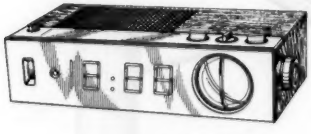
240,550
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,705
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



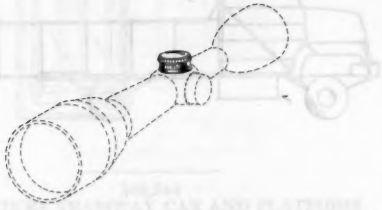
240,551
FLASHLIGHT
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Aug. 29, 1974, Ser. No. 501,706
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A



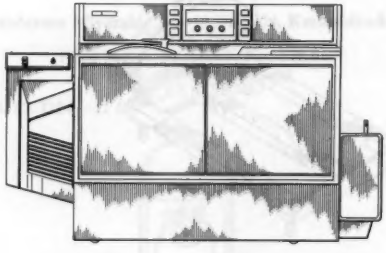
240,552
DIGITAL CLOCK RADIO
Masanori Hamada, Moriguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed Dec. 17, 1974, Ser. No. 533,730
Claims priority, application Japan July 3, 1974
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D56—4 B



240,553
RIFLESCOPE ELEVATION ADJUSTMENT ASSEMBLY
Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Jan. 2, 1975, Ser. No. 538,086
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E

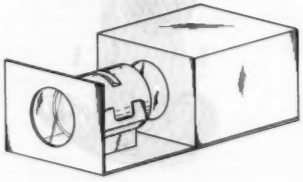


240,554
DUPLICATING MACHINE WITH SORTER
Thomas R. Cross, Rochester, Clifford L. George, Macedon, and Jacob W. Patla, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 22, 1974, Ser. No. 526,286
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

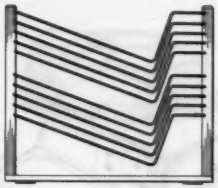


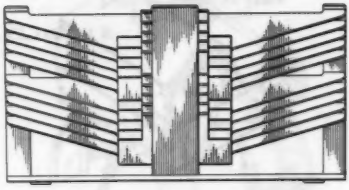
240,555
SORTER
Thomas R. Cross, Rochester, Clifford L. George, Macedon, and Jacob W. Patla, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 22, 1974, Ser. No. 526,287
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D16—32

240,556
LENS VIEWER
Stanley Kirk, 3619 Lynn Lane, Wantagh, N.Y. 11793
Filed Dec. 23, 1974, Ser. No. 535,204
Term of patent 3½ years
Int. Cl. D10—*04;* D16—*05*
U.S. Cl. D10—81

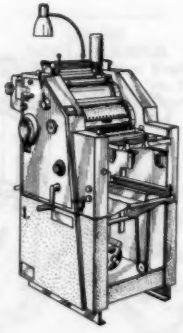


240,557
TRAY RACK
Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Continuation-in-part of design application Ser. No. 319,834, Dec. 29, 1972, now Patent No. 236,030. This application Sept. 16, 1974, Ser. No. 506,383
Term of patent 14 years
Int. Cl. D16—*05;* D18—*99*
U.S. Cl. D16—32

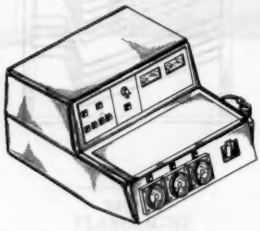


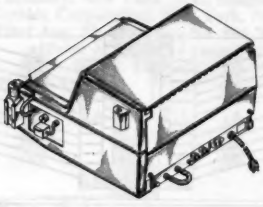


240,558
OFFSET PRINTING MACHINE
Takeshi Shohoji, Fukuyama, and Etsuo Hiraishi, Hiroshima-ken, Japan, assignors to Ryobi, Ltd., Fuchu, Hiroshima, Japan
Filed Nov. 27, 1974, Ser. No. 527,778
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R

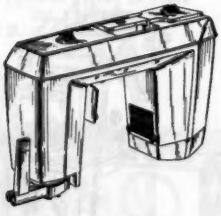


240,559
PERITONEAL DIALYSIS UNIT OR THE LIKE
Harold H. Kawaguchi, Seattle, Wash., assignor to Physio-Control Corporation
Filed July 11, 1974, Ser. No. 487,469
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F





240,560
HYDROTHERAPY UNIT FOR BATH TUBS
Henry J. Talge, Leawood, and James M. Gerdom, Overland Park, Kans., assignors to Whirl-O-Matic Corporation, Kansas City, Mo.
Filed Sept. 5, 1975, Ser. No. 610,618
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 C

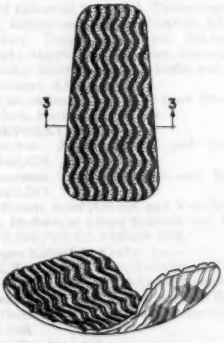


240,561
HAIR DRYER
Raymond W. Dybala, Chicago, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 14, 1974, Ser. No. 433,334
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

240,562
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,725
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A

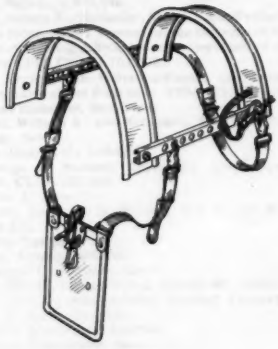
240,563
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,726
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A

240,564
THIN ABSORBENT PAD FOR A SANITARY NAPKIN OR THE LIKE
Howard A. Whitehead, Appleton, and Ralph V. Braun, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 26, 1974, Ser. No. 500,727
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A

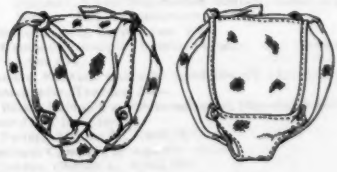


240,565
HAIR DRYER BASE
Douglas Long, Lombard, and Bernard B. Bluestein, Des Plaines, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 10, 1975, Ser. No. 540,019
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

240,566
CARRYING HARNESS
Ingvar Westerberg, Vretvagen 39, S–352 47 Vaxjo, Sweden
Filed Oct. 9, 1974, Ser. No. 513,496
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



240,567
DOLL CARRIER
Susan Tatum, 34 E. 3rd St., New York, N.Y. 10003
Filed Nov. 6, 1974, Ser. No. 521,257
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 A



240,568
PURSE GUARD
Robert Grant Ammons, Sr., 1533 Northwick Road, Baltimore, Md. 21218
Filed Oct. 8, 1974, Ser. No. 513,122
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—2 R

240,569
SAFETY RAZOR
Tatsuya Saito, Seki, Japan, assignor to Sanwa Cutlery Co., Ltd., Tokyo, Japan
Filed Oct. 25, 1974, Ser. No. 518,176
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Bofors: *See—*
Malm, Karl Olof Bertil, 3,968,749.

AB Teleplan: *See—*
Nordlof, Karl Gustav Gosta Lennart, 3,969,673.

AB Volvo: *See—*
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Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, 3,969,211.

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Thausing, Heinrich E.; and Wallis, Roger G., 3,969,041.

Achenbach, Dieter: *See—*
Kolb, Walter; and Achenbach, Dieter, 3,968,820.

Ackermann, Jacob; and Radici, Pierino, to Societa' Italiana Resine S.p.A. Method of purifying polymerizable organic substances. 3,969,344, Cl. 260-239.30A.

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Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., to Boots Company Limited, The. Phenylalkanoic acids. 3,969,402, Cl. 260-520.00R.

Addison, Harry J., Jr.: *See—*
Kowalick, James F.; Hare, George F.; and Addison, Harry J., Jr., 3,968,724.

Addressograph Multigraph Corporation: *See—*
McCabe, Peter, 3,969,742.

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Ahntholz, Herbert, to Litton Systems, Inc. Line isolation monitor and alarm. 3,969,711, Cl. 340-255.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
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Aksenov, Yakov Dmitrievich; Gumansky, Georgy Alexandrovich; Drako, Valery Mikhailovich; and Fedoseenko, Nikolai Konstantinovich. Metalloceramic current-conducting material and a method for preparing same. 3,969,278, Cl. 252-513.000.

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Schlegel, William R.; and Hennessey, John J., 3,968,947.

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Allis-Chalmers Corporation: *See—*
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Alontsev, Viktor Stepanovich: *See—*
Barannik, Ivan Andrecvich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

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Altemare, Kenneth. Hair clip. 3,968,806, Cl. 132-48.00R.

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Brault, Thierry; and Lacroix, Jean-Claude, 3,969,669.

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Amano, Haruyuki: *See—*
Ohta, Yoshimoto; Hayashida, Yoshihiro; and Amano, Haruyuki, 3,969,000.

Amano, Hitoshi; and Tsuchiya, Yoshifumi, to Takayuki Nomura. Overload safety device. 3,968,705, Cl. 74-424.80R.

Amberg, Ralph G.: *See—*
Amberg, Stephen W.; and Amberg, Ralph G., 3,969,173.

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Amchem Products, Inc.: *See—*
Waldrum, John E., 3,968,933.

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Ellsworth, Robert E., 3,969,551.

American Home Products Corporation: *See—*
Bourns, George B., 3,969,535.

American Optical Corporation: *See—*
Brandt, Neill M.; and Deeg, Emil W., 3,969,023.
Shoulders, Kenneth R., 3,969,039.

Amery, John Gordon, to RCA Corporation. Color image signal processing circuits. 3,969,757, Cl. 358-4.000.

Amery, John Gordon, to RCA Corporation. Defect compensation systems. 3,969,759, Cl. 358-8.000.

Ames, Ira R., Jr.: *See—*
Morse, Walter H.; and Ames, Ira R., Jr., 3,969,003.

AMF Incorporated: *See—*
Grosser, Richard W.; and Long, Virgil L., 3,968,964.
Jackson, Bobby R., 3,968,568.
Jenks, Herbert R., 3,969,557.
Kelly, T. Kenneth; and Savitz, Donald Alfred, 3,968,804.
Neville, Richard Ernest Gartside, 3,968,904.
Terry, Ronald, 3,969,599.

AMP Incorporated: *See—*
Clark, Donald George; and Brown, Ivan Godfrey Oliver, 3,968,548.

Amselem, Armand, to Parcor. Process for the preparation of thieno [3,2-c] pyridine and thieno [2,3-c] pyridine. 3,969,358, Cl. 260-294.80C.

Anderson, Arlynn Wesley, to Caterpillar Tractor Co. Vertical curing mold for tube-tires. 3,969,050, Cl. 425-40.000.

Anderson Corporation: *See—*
Sasena, Robert C.; and Priest, Roger E., 3,969,090.

Anderson Development Company: *See—*
Meyer, Jeffrey G., 3,969,272.

Anderson Engineers, Inc.: *See—*
Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., 3,969,132.

Anderson, Harry E.; Helsel, Kenneth E.; and Heasley, Raymond E., to Anderson Engineers, Inc. Self-cleaning water table system. 3,969,132, Cl. 134-18.000.

Anderson, John Dale; Lutz, Bruce Leo; and Garrison, Harold Keith, to Hesston Corporation. Stack-forming machine having uniform loading control. 3,968,634, Cl. 56-344.000.

Anderson, Joseph C.; and Davitt, H. James, to Great Canadian Oil Sands Limited; and Sun Oil Company of Pennsylvania. Aerating tar sands-water mixture prior to settling in a gravity settling zone. 3,969,220, Cl. 208-11.0LE.

Anderson, Kenneth E.: *See—*
Hunter, Jack A.; and Anderson, Kenneth E., 3,969,548.

Anderson, Norman C., to Varian Associates. Brazing mixture for forming a corrosion-resistant vacuum-tight seal between a ceramic body and a refractory metal. 3,969,126, Cl. 106-290.000.

Anderson, Terry M.; and Schumann, Reinhard, to Warner & Swasey Company, The. Central processing unit for use in a microprocessor. 3,969,724, Cl. 340-172.500.

Ando, Yoshio: *See—*
Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, 3,969,211.

Andress, Harry J., Jr., to Mobil Oil Corporation. Lubricant compositions containing benzotriazole derivatives as copper passivators. 3,969,237, Cl. 252-49.900.

Andrew Corporation: *See—*
Merle, Michel, 3,968,918.

Anzai, Yasuo: *See—*
Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Hirose, Yoshio, 3,969,188.

Aoyagi, Juro: *See—*
Shinohara, Isao; and Aoyagi, Juro, 3,969,239.

Applied Systems Laboratories: *See—*
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Araki, Michio: *See—*
Ishikawa, Toshio; Hayakawa, Takashi; Nishimura, Tsutomu; Araki, Michio; and Takehira, Katsuomi, 3,969,428.

Arbed-Felten & Guilleaume Drahtwerke GmbH: *See—*
Boeckenhoff, Hermann Josef; Thoms, Gunter; and Pueschner, Erich, 3,969,085.

Archibald, John Leheup; White, Alan Chapman; and Black, Robin Michael, to John Wyeth & Brother Limited. Hexahydroimidazo[1,5-A]pyridines. 3,969,528, Cl. 424-267.000.

Arentzen, Einar M., to Dresser Industries, Inc. Continuous mining machine with a chain drive for the cutting head. 3,968,995, Cl. 299-76.000.

Argoudelis, Alexander D.; and Reusser, Fritz, to Upjohn Company, The. Antibiotic U-48,266. 3,969,515, Cl. 424-118.000.

Arima, Takeo, to Hochiki Corporation. Apparatus for picking up signal currents flowing through signal lines. 3,969,710, Cl. 340-253.00R.

Arimoto, Kenji: *See—*
Aishima, Itsuho; Takashi, Yukichi; Katayama, Yoshihiko; Arimoto, Kenji; and Matsumoto, Koichi, 3,969,313.

Arimura, Ichiro; Taniguchi, Hiroshi; and Yamamitsu, Chojuro, to Matsushita Electric Industrial Co., Ltd. Equipment for recording and reproducing color television signal. 3,969,755, Cl. 358-4.000.

Arioli, Amedea; and Arioli, Lorenza. Apparatus for final immersion washing of fabrics. 3,968,664, Cl. 68-22.00R.

Arioli, Lorenza: *See—*
Arioli, Amedea; and Arioli, Lorenza, 3,968,664.

Arion, Nicolae Mihail, to Institutul de Proiectari Tehnologice Pentru Industria Chimica-Iprochim. Moving bed ion-exchange apparatus and operating method thereof. 3,969,243, Cl. 210-25.000.

Armco Steel Corporation: *See—*
Tanczyn, Harry, 3,969,109.

Armitage, Bernard J.: *See—*
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 3,969,402.

Armstrong, Arthur A., to Monsanto Company. Method of making an acrylic spinning solution. 3,969,305, Cl. 260-32.60N.

Arnold Engineering Company: *See—*
Graf, Richard B.; Chant, Edward H., Jr.; and Marco, John F., 3,969,456.

Arthur, William C.; and Steger, William W., to Storage Technology Corporation. Capstan control for a tape drive system. 3,969,663, Cl. 318-561.000.

Asahara, Masaru; Toyonaga, Noriyasu; Ohyama, Hiroaki; Nakamura, Hiroshi; and Yoshizawa, Ryushiro, to Fujitsu Ltd. Band pass filter circuit with automatic bandwidth adjust. 3,969,678, Cl. 328-167.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aishima, Itsuho; Takashi, Yukichi; Katayama, Yoshihiko; Arimoto, Kenji; and Matsumoto, Koichi, 3,969,313.
Horiuchi, Yasuo; and Katsube, Toraichi, 3,969,475.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Nobusawa, Tsukumo, 3,969,735.

Asai, Osamu: *See—*
Suzuki, Katsumi; Kawakami, Toshio; and Asai, Osamu, 3,969,153.

Asai, Takashi: *See—*
Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, 3,969,494.

Asai, Takeji; and Yamazumi, Kaishu, to Kabushiki Kaisha Fujikoshi. Gas carburizing furnace. 3,968,957, Cl. 266-257.000.

Asarco Incorporated: *See—*
Albrethsen, Adrian E.; Hollander, Max L.; and Wetherill, William H., 3,969,202.

Aschwanden, Paul: *See—*
Mettler, Hermann; and Aschwanden, Paul, 3,968,547.

Ashland Oil, Inc.: *See—*
Toeniskoetter, Richard H.; and Spiwak, John J., 3,968,828.

Association of Motion Picture and Television Producers Inc., The: *See—*
Vlahos, Petro, 3,969,593.

Astra Lakemedel Aktiebolag: *See—*
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 3,969,395.

Atia, Ali Ezzeldin: *See—*
Williams, Albert Edward; and Atia, Ali Ezzeldin, 3,969,692.

Atkey, Richard E., to Dover Corporation. Hydraulic elevator installation. 3,968,860, Cl. 187-17.000.

Atkins, Jimmy G.: *See—*
Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle, 3,968,962.

Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle. Child's Teeter Totter. 3,968,962, Cl. 272-55.000.

Atkins, Vonniebelle: *See—*
Atkins, Luther C.; Atkins, Jimmy G.; and Atkins, Vonniebelle, 3,968,962.

Atkinson, Alan W., to TBA Industrial Products Limited. Glass compositions and fibers made therefrom. 3,969,121, Cl. 106-50.000.

Audio Stockholm: *See—*
Wallander, Gunnar; and Bostrom, Bernt, 3,969,672.

Auergesellschaft GmbH: *See—*
Geissler, Rolf, 3,968,793.

Auge, Wolfgang: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 3,969,374.

Auracher, Franz, to Siemens Aktiengesellschaft. Photoresist layer waveguide coupling device. 3,969,014, Cl. 350-96.00C.

Auriemma, Robert Sinbad. Underground drain pipe coupling. 3,968,654, Cl. 61-11.000.

Austin-Gordon Design, Inc.: *See—*
Peva, Stanley W., Jr., 3,968,901.

Austin, Thomas E.; and Mason, Robert W., to Allied Chemical Corporation. Process for synthesis of chlorodifluoroamine. 3,969,487, Cl. 423-351.000.

Automatech Industries Inc.: *See—*
Rovin, Herman; Kreidel, Rudolf; and Levine, Lawrence J., 3,968,760.

Automatisation - Sogemo: *See—*
Mariaulle, Claude, 3,968,971.

B & L Metal Products (Elmira) Limited: *See—*
Scherrer, John J., 3,968,743.

B. R. Chemical Co., Ltd.: *See—*
Shinohara, Isao; and Aoyagi, Juro, 3,969,239.

Baardsen, Edward Lund, to Ford Motor Company. Method of welding galvanized steel. 3,969,604, Cl. 219-121.0LM.

Baba, Shigeji: *See—*
Sakai, Hidemaru; and Baba, Shigeji, 3,969,117.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Suzuki, Katsumi; Kawakami, Toshio; and Asai, Osamu, 3,969,153.

Bachler, Werner, to Leybold-Heraeus GmbH & Co. KG. Turbomolecular vacuum pump having a gas bearing-supported rotor. 3,969,042, Cl. 417-354.000.

Bachmann, Mario E. Tablet dispenser. 3,968,902, Cl. 221-263.000.

Bachofer, Henry L., to Sun Oil Company of Pennsylvania. Drum filling device. 3,968,819, Cl. 141-155.000.

Baconnier, Emile Felix; and Delicheres, Francois. Device for distributing dyestuffs or other additional materials in extruders or the like. 3,969,053, Cl. 425-132.000.

Bacquie, Serge B.; and Dagnaux, Jean G., to Societe Anonyme: Poclain. Fluid feed device comprising a constant cylinder capacity pump and at least one variable cylinder capacity pump. 3,968,650, Cl. 60-428.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Osieka, Hans; Pommer, Ernst-Heinrich; and Kiefer, Hans, 3,969,510.
Urbach, Hans; and Adolphi, Heinrich, 3,969,439.

Baertsch, Richard D.; Tiemann, Jerome J.; and Engeler, William E., to General Electric Company. Charge sensing circuit for charge transfer devices. 3,969,636, Cl. 307-235.00H.

Bagnasco, Michael: *See—*
Langford, Obie M.; and Bagnasco, Michael, 3,969,630.

Bailey, Alfred, to Kar-Ta-Craft Corporation. Knock down boat construction. 3,968,532, Cl. 9-2.00C.

Bailey, Charles Eugene; and Roura, Miguel Jacinto, to Du Pont de Nemours, E. I., and Company. Process for finishing tetrafluoroethylene-hexafluoropropylene copolymers. 3,969,435, Cl. 260-900.000.

Baker, Ronald L., to Lutes, Thomas G., a part interest. Dental syringe. 3,968,796, Cl. 128-173.100.

Balkanli, Hayati, to Lynes, Inc. Environmental condition sensing apparatus. 3,968,691, Cl. 73-345.000.

Ball Corporation: *See—*
Kwiatkowski, Jerome A.; and Wood, Charles L., 3,969,703.

Ball, George L., III: *See—*
Wilson, Glenn R.; Salyer, Ival O.; and Ball, George L., III, 3,969,286.

Ball, Kenneth, to Intertek Technical Services Limited. Method of working underwater. 3,968,656, Cl. 61-69R.

Ballard, Denis George Harold; Parkins, Adrian Walter; Robinson, Peter Anthony; Ibekwe, Samuel Dimewere; Lappert, Michael Franz; and Pearce, Ronald, to Imperial Chemical Industries Limited. Organo-metallic compounds. 3,969,386, Cl. 260-429.00R.

Ballentine, Earle W. Protection of gas burners. 3,969,064, Cl. 431-90.000.

Ballinger, Dale O., to Honeywell Inc. Capstan and motor assembly. 3,968,920, Cl. 226-188.000.

Ballis, Joseph A., to Medtronic, Inc. Cautery protection circuit for a heart pacemaker. 3,968,802, Cl. 128-419.0PG.

Banyas, John D.; and Ross, Edward A., to Owens-Illinois, Inc. Spin cycle mechanism for glass article forming machine. 3,968,870, Cl. 198-240.000.

Baran, Robert J. Apparatus for reducing window breakage by wind pressure. 3,968,607, Cl. 52-173.00R.

Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich. Granules of magnesium and its alloys. 3,969,104, Cl. 75-.50B.

Barient Company: *See—*
Guangorena, Jesus, 3,968,953.

Barker, James F.: *See—*
Corrons, Bill E.; and Barker, James F., 3,969,689.

Barnes, Richard R., Jr.; MacArthur, Douglas E.; Wodell, William Roy; and Barnard, Irving Herbert, to Barnes, Richard R., Jr.; and MacArthur, Douglas E. Air cargo shipping container. 3,968,895, Cl. 220-1.500.

Barrett, Doreen Veronica. Flotation separation. 3,969,216, Cl. 204-286.000.

Barringer, Jerry M.: *See—*
Hodsdon, Roy F.; and Barringer, Jerry M., 3,969,728.

Barrows, Franklin H.: *See—*
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Barry, Henry F.: *See—*
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Bart, Joannes: *See—*
Faletti, Franco; Giordano, Nicola; Marinozzi, Paolo; Bart, Joannes; and Castellan, Arsenio, 3,969,390.

Baryshevsky, Leonid Mikhailovich: *See—*
Perevozkin, Jury Leibovich; Mkrtychian, Anatoly Aramovich; Baryshevsky, Leonid Mikhailovich; Livshits, Vadim Manuilovich; Meilikhov, Daniel Semenovich; Govorov, Jury Ivanovich; Beschastny, Andrei Stepanovich; and Maximov, Fedor Spiridonovich, 3,968,827.

BASF Aktiengesellschaft: *See—*
de Beuckelaer, Gerard; Krome, Gerd; Langens, Jan; Lockefeer, Ferdinand; and Schaerlaekens, Paul, 3,969,490.
Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, 3,969,333.
Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, 3,969,335.
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Okey, Bernard J., 3,969,758.
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Basham, Monte C., to Raymond Lee Organization, Inc., The, a part interest. Preloaded disposable button bait device. 3,968,589, Cl. 43-81.000.

Bashlow, Joy Anne. Combined head and neck wear. 3,968,521, Cl. 2-203.000.

Basiulis, Algerd, to Hughes Aircraft Company. Controlled vapor chamber cooking device. 3,968,787, Cl. 126-390.000.

Bassani, Giovanpietro: *See—*
Marchetti, Gianfranco; and Bassani, Giovanpietro, 3,969,638.

Basse, William J.: *See—*
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Bassett, Howard D.; Schrage, Franklin E.; and Kirkpatrick, George F., to Union Carbide Corporation. Method for heat sealing polyester film. 3,969,176, Cl. 156-251.000.

Batka, Heimold; and Altenschopfer, Theodor, to Henkel & Cie G.m.b.H. Process for using clear rinsing agents in mechanical dishwashing. 3,969,134, Cl. 134-26.000.

Batz, Friedrich: *See—*
Lauer, Karl; Stoeck, Georg; and Batz, Friedrich, 3,969,337.

Bauer, Anton Ernst, to Bunker Ramo Corporation. Stamped contact tip. 3,969,012, Cl. 339-252.00P.

Bauer, James J., to Clark Equipment Company. Two-speed motor control for dual hydrostatic transmissions. 3,968,706, Cl. 74-471.00R.

Baugh, Benton F., to Vetco Offshore Industries, Inc. Underwater connection apparatus. 3,968,838, Cl. 166-.600.

Bayer Aktiengesellschaft: *See—*
Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, 3,969,522.
Radlmann, Eduard; Schaffner, Heinz; Lorenz, Gunter; and Nischk, Gunther, 3,969,318.
Schneider, Joachim, 3,969,411.
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 3,969,374.
Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, 3,969,262.

BBC Brown Boveri & Company Limited: *See—*
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Beadle, Howard C., to R. T. Vanderbilt Company, Inc. Synergistic antioxidant combination of organic phosphite and amine. 3,969,315, Cl. 260-45.8NW.

Bean, Kenneth E., to Texas Instruments Incorporated. Substrate for dielectric isolated integrated circuit with V-etched depth grooves for lapping guide. 3,969,749, Cl. 357-49.000.

Bean, Kenneth Elwood: *See—*
Kendall, Don Leslie; Padovani, Francois Antoine; Bean, Kenneth Elwood; and Matzen, Walter Theodore, 3,969,746.

Beaucamp, Klaus: *See—*
Jaworek, Dieter; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Bergmeyer, Hans Ulrich; and Botsch, Karl-Heinz, 3,969,287.

Beaudoin, Guy; and Vincent, Marcel, to Skiroule Ltee. Centrifugally controlled expansible pulley with manually engaged negative torque responsive means. 3,968,702, Cl. 74-230.17E.

Beavers, Allan E., to T. A. Pelsue Company. Van tent for open-ended vans. 3,968,809, Cl. 135-4.00A.

Becher, Heinz Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for preparation of 2-methoxy-3,6-dichloro-benzoic acid. 3,969,403, Cl. 260-521.00H.

Becher, Heinz Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for preparation of 2-methoxy-3,6-dichloro-benzoic acid. 3,969,404, Cl. 260-521.00H.

Becker, Carl: *See—*
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Beckman Instruments, Inc.: *See—*
Chervenka, Charles H., 3,968,557.

Beer, Andrew E. Magnetostrictive closure member. 3,968,898, Cl. 220-260.000.

Beijen, James H., to Fabsco Corporation. Method of forging a solid head on a hollow steel tube. 3,968,919, Cl. 228-153.000.

Beil, Valentin E.; and Ihlenfeld, Francis J., to McDonald Products Corporation. Multiple stacking letter tray. 3,968,881, Cl. 211-128.000.

Beiser, Carl Adolph, to National Steel Corporation. Chromizing process using columbium as stabilizer. 3,969,550, Cl. 427-253.000.

Belcher, Richard A., to Chase-Shawmut Company, The. Electric fuse and terminal plug therefor. 3,969,695, Cl. 337-236.000.

Belicic, Martin, to Siemens Aktiengesellschaft. Coaxial metallurgical connection. 3,968,982, Cl. 285-287.000.

Belkin, Gennady Ivanovich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Bell, Richard L.; and Walter, Richard T., to Container Corporation of America. Hollow wall carton corner arrangement. 3,968,923, Cl. 229-34.0HW.

Bell Telephone Laboratories, Incorporated: *See—*
Cho, Alfred Yi; and Tracy, Joseph Charles, Jr., 3,969,164.
Fabricius, Wayne Nixon, 3,969,683.
Kaiser, Peter; and Marcatili, Enrique Alfredo Jose, 3,969,016.
Meise, Henry August, Jr.; and Taylor, George William, 3,969,589.

Bell, Weldon K.; and Chang, Clarence D., to Mobil Oil Corporation. Conversion of alcohols and/or ethers to hydrocarbons. 3,969,427, Cl. 260-676.00R.

Bellmann, Bernard R., to Dayco Corporation. Endless power transmission belt. 3,968,703, Cl. 74-231.00C.

Belosludtsev, Valery Sergeevich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and by Chirkov, Mikhail Nikolaevich, administrator. Method of producing butene-1. 3,969,429, Cl. 260-683.15D.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,968,728.

Bense, William Malcolm, to Leesona Corporation. Traverse cam lubrication. 3,968,939, Cl. 242-43.00R.

Benton, Linda A., trust administrator: *See—*
Wolfe, Denis G.; Mitts, Richard K.; Jackson, Wilbur F., deceased; and Benton, Linda A., trust administrator, 3,969,696.

Berdan, Betty L.; and Luce, Betty M., to Gould Inc. Coating aluminum with a strippable copper deposit. 3,969,199, Cl. 204-33.000.

Berets, Donald Joseph; Castellion, George Augustus; and Haacke, Gottfried, to American Cyanamid Company. Electrochromic information displays. 3,968,639, Cl. 58-23.00R.

Berger Maschinenfabriken G.m.b.H. & Co.: *See—*
Moelders, Johann, 3,969,226.

Bergmeyer, Hans Ulrich: *See—*
Jaworek, Dieter; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Bergmeyer, Hans Ulrich; and Botsch, Karl-Heinz, 3,969,287.

Bergson, Gustav. Apparatus for water determination. 3,969,210, Cl. 204-195.00W.

Berkau, Eugene E.; and Capps, Cecil W., to Monsanto Company. Continuous process for drying, crystallizing and solid state polymerizing polyesters. 3,969,324, Cl. 260-75.00T.

Berkley & Company, Inc.: *See—*
Holzhauer, Henry J., 3,968,725.

Berkowitz, Sidney, to FMC Corporation. Crude cyanuric acid purification. 3,969,352, Cl. 260-248.00A.

Berman, Richard: *See—*
Catarious, Joseph; Bethke, Lyman; and Berman, Richard, 3,969,079.

Bernard, Irving Herbert: *See—*
Barnes, Richard R., Jr.; MacArthur, Douglas E.; Wodell, William Roy; and Bernard, Irving Herbert, 3,968,895.

Bernardin, Rodney A.: *See—*
Burford, Milton K.; Mattis, Joseph F.; Gratton, Peter D.; Donahue, William J.; Halling, Michael A.; Pinkerton, Ken; Cammack, Thomas A.; Bernardin, Rodney A.; Johnson, Lee; Lohmann, Art; and Abt, Ed, 3,968,748.

Bernhard, Peter: *See—*
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Bertens, Theodorus Cornelius Johannes Maria; Van Dijk, Hendrikus Josephus Antonius; and Gerkema, Jan T., to U.S. Philips Corporation. Method of manufacturing a device comprising a semiconductor body. 3,968,565, Cl. 29-603.000.

Beschastny, Andrei Stepanovich: *See—*
Perevozkin, Jury Leibovich; Mkrtychian, Anatoly Aramovich; Baryshevsky, Leonid Mikhailovich; Livshits, Vadim Manuilovich; Meilikhov, Daniel Semenovich; Govorov, Jury Ivanovich; Beschastny, Andrei Stepanovich; and Maximov, Fedor Spiridonovich, 3,968,827.

Bethke, Lyman: *See—*
Catarious, Joseph; Bethke, Lyman; and Berman, Richard, 3,969,079.

Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., to United States of America, Army. Noise controllable nozzle closure. 3,968,646, Cl. 60-271.000.

Beutel, Rainer: *See—*
Stahlhofen, Paul; and Beutel, Rainer, 3,969,118.

Bezstarosti, Ladislav; Cizek, Jaroslav; Jekl, Frantisek; and Martinek, Lumir, to Vyzkumny Ustav Bavlnarsky. Method of and apparatus for continuous progressive beating up of weft in travelling-wave shedding looms. 3,968,817, Cl. 139-436.000.

BHS-Bayerische Berg Hutten-und Salzwerke Aktiengesellschaft: *See—*
Mosburger, Hans, 3,968,713.

Biggs, James W.: *See—*
Pugh, Donald W.; and Biggs, James W., 3,969,304.

Biospherics Incorporated: *See—*
Schrot, Joseph R., 3,969,496.

Birdsboro Corporation: *See—*
Turner, John F., 3,968,671.

Birleson, S. Vincent, to Texas Instruments Incorporated. Two channel monopulse receiver. 3,969,726, Cl. 343-16.00M.

Black, Hugh. Fasteners. 3,968,720, Cl. 85-11.000.

Black, Robin Michael: *See—*
Archibald, John Leheup; White, Alan Chapman; and Black, Robin Michael, 3,969,528.

Blanchard, Clarence E., to Outboard Marine Corporation. Marine propulsion device adapted for a sailboat. 3,968,767, Cl. 115-.50E.

Blattler, Ernst; and Roner, Werner, to Elektrowatt AG. Thermostatic expansible material-working element. 3,968,692, Cl. 73-363.000.

Blocker, Truman G., III, to Texas Instruments Incorporated. Interconnection in multi element planar structures. 3,969,745, Cl. 357-22.000.

Blouin, Michel; and Mercier, Leo. Combined infant pacifier and thermometer. 3,968,690, Cl. 73-343.00R.

Blucher, Richard L.: *See—*
Collins, William H.; Blucher, Richard L.; and Evans, Edward R., 3,969,154.

Bobenrieth, Albert, to Thomson-CSF. Logic circuits-employing junction-type field-effect transistors. 3,969,632, Cl. 307-205.000.

Bobrov, Gennady Grigorievich: *See—*
Savenkova, Zinaida Alexandrovna; Logvinenko, Dmitry Danilovich; Tsantker, Karl Lazarevich; Shelyakov, Oleg Porfirievich; Manzhely, Alexandra Pavlovna; Bobrov, Gennady Grigorievich; Ioffe, Genrikh Samuilovich; Mironov, Boris Vasilievich; Kestelman, Pavel Iosifovich; and Egorycheva, Galina Vasilievna, 3,969,129.

Bode, Kurt, to Rollei-Werke Franke & Heidecke. Motion picture camera with sound recording means. 3,969,021, Cl. 352-27.000.

Boe, Norman Wendell, to Monsanto Company. Man-made textile antistatic strand. 3,969,559, Cl. 428-87.000.

Boeckenhoff, Hermann Josef; Thoms, Gunter; and Pueschner, Erich, to Arbed-Felten & Guilleaume Drahtwerke GmbH. Wire and method for making steel wool. 3,969,085, Cl. 29-193.000.

Boehringer Ingelheim GmbH: *See—*
Engel, Wolfhard; Teufel, Helmut; Seeger, Ernst; and Engelhardt, Gunther, 3,969,419.
Koppe, Herbert; Stahle, Helmut; Kummer, Werner; Muacevic, Gojko; and Traunecker, Werner, 3,969,512.
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 3,969,410.
Nickl, Josef; Teufel, Helmut; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, 3,969,523.
Teufel, Helmut; Engel, Wolfhard; and Seeger, Ernst, 3,969,418.
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Boehringer Mannheim GmbH: *See—*
Jaworek, Dieter; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Bergmeyer, Hans Ulrich; and Botsch, Karl-Heinz, 3,969,287.
Lauer, Karl; Stoeck, Georg; and Batz, Friedrich, 3,969,337.

Boeing Company, The: *See—*
Cole, James B., 3,968,946.
Reilly, Mason J., 3,968,863.

Boesch, Donald Edward; and Koita, Yusuf Taher, to Western Electric Company, Inc. Transfer molding thermosetting polymeric material. 3,969,461, Cl. 264-163.000.

Bogdanov, Alexandr Petrovich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Belosludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. O-(2-Vinylphenyl)-thiolphosphates. 3,969,442, Cl. 260-951.000.

Bognar, Rezso: *See—*
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Nagy, Gabor;

David, Agoston; Bognar, Rezso; Makleit, Sandor; and Valovics, Gyula, 3,969,519.

Boiko, Jury Nikolaevich: *See*—
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Boisde, Gilbert; Cogez, Paul; Lachenal, Jean-Michel; and Lamare, Michel, to Commissariat a l'Energie Atomique. Control device for a fluidic-control jack. 3,968,735, Cl. 92-13.800.

Bokros, Jack C., to General Atomic Company. Carbon-coated articles and method of making same. 3,969,130, Cl. 117-332.000.

Bolen, Gerhard N.; Dunbar, Sidney G.; and Smock, George E., to Owens-Corning Fiberglas Corporation. Fibrous bodies and method and apparatus for producing same. 3,969,171, Cl. 156-167.000.

Bollenbach, Gunther, to Dr. C. Otto & Comp. G.m.b.H. Control for regenerators of a horizontal coke oven. 3,969,191, Cl. 202-141.000.

Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; Kocher, Donald Francis; and Rosenbaum, Walter Steven, to International Business Machines Corporation. Cluster storage apparatus for post processing error correction of a character recognition machine. 3,969,698, Cl. 340-146.3WD.

Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, to International Business Machines Corporation. Regional context maximum likelihood error correction for OCR, keyboard, and the like. 3,969,700, Cl. 340-146.3WD.

Bolt Beranek and Newman, Inc.: *See*—
Hirtle, Parker W., 3,968,597.

Bommaraju, Tilak V.; and Stephens, Donald E., to Hooker Chemicals & Plastics Corporation. Electrolytic anode. 3,969,217, Cl. 204-290.00F.

Boonstra, Lieuwe; and van Alem, Antonius Adrianus Marius, to U.S. Philips Corporation. Apparatus for reading a record carrier with an optical information structure. 3,969,576, Cl. 178-6.60R.

Boots Company Limited, The: *See*—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 3,969,402.

Borg-Warner Corporation: *See*—
Fogelberg, Mark J., 3,968,704.
Poklacki, Erwin S., 3,969,253.

Borman, Willem F. H.; and Reilly, Eugene P., to General Electric Company. Stabilized polyester compositions. 3,969,306, Cl. 260-33.60R.

Borodin, Viktor Ivanovich: *See*—
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Bosch, Paul: *See*—
Nonnenmacher, Gerhard; Bosch, Paul; and Fricke, Hans-Jurgen, 3,969,038.

Bosch-Siemens Hausgerate GmbH: *See*—
Amann, Klaus; and Dienemann, Wolfgang, 3,968,660.

Bossler, Robert, Jr., to Kaman Aerospace Corporation. Bolt stress detector. 3,969,713, Cl. 340-265.000.

Bostrom, Bernt: *See*—
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Botsch, Karl-Heinz: *See*—
Jaworek, Dieter; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Bergmeyer, Hans Ulrich; and Botsch, Karl-Heinz, 3,969,287.

Bouchaudon, Jean, to Rhone-Poulenc Industries. Derivatives of penicillanic acid and compositions containing them. 3,969,342, Cl. 260-239.100.

Boucher, Roger W.: *See*—
Packer, Gilbert; Boucher, Roger W.; Moore, James M.; Wark, John D.; and Holzwarth, Henry A., 3,968,797.

Boudigues, Serge, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Multiflow gas turbine power plant. 3,968,647, Cl. 60-262.000.

Boughton, Peter; and Clarke, David Bernard Swann, to U.S. Philips Corporation. Plasma-MIG arc welding. 3,969,603, Cl. 219-121.00P.

Boulanger, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Frequency-division multiplexer for telephone transmission providing for transposition of conversation and calling channels into a primary frequency group. 3,969,585, Cl. 179-15.0FD.

Bourns, George B., to American Home Products Corporation. Popcorn package. 3,969,535, Cl. 426-111.000.

Bouwhuis, Gijsbertus; and Simons, Carel Arthur Jan, to U.S. Philips Corporation. Apparatus for reading a record carrier on which information is stored in an optically readable structure. 3,969,573, Cl. 178-6.60R.

Bowers, Gary L.; Davenport, Clyde M.; and Stephens, Albert E., to United States of America, Energy Research and Development Administration. Interpolator for numerically controlled machine tools. 3,969,615, Cl. 235-151.110.

Bowman, Harold M., to National Utility Products Company. Adjustable manhole cover support structure. 3,968,600, Cl. 52-19.000.

BP Chemicals International Limited: *See*—
Westermann, Peter Henry, 3,969,326.

Braden, Ralph S., to General Motors Corporation. Slab completion thermostat with time delay function. 3,969,097, Cl. 62-137.000.

Brandt, Neil W. Socket locking structure. 3,969,622, Cl. 240-140.000.

Brandt, Neill M.; and Deeg, Emil W., to American Optical Corporation. Method and apparatus for detecting layers of stress in lenses. 3,969,023, Cl. 356-33.000.

Branson Ultrasonics Corporation: *See*—
Obeda, Edward G., 3,969,544.

Brault, Thierry; and Lacroix, Jean-Claude, to Aluminum Pechiney. Method and apparatus for continuously determining the internal resistance of an electrolysis cell. 3,969,669, Cl. 324-65.00R.

Braun, Dieter, to Fortuna-Werke Maschinenfabrik AG. Device for use in the manufacture of shoes. 3,968,534, Cl. 12-127.000.

Breitling, Ulrich, to Krauss-Maffei Aktiengesellschaft. Circuit arrangement for magnetic suspension vehicle systems. 3,968,753, Cl. 104-148.0MS.

Brenner, Gordon M., to M.G.B., Inc. Auger wiper. 3,968,846, Cl. 175-84.000.

Breuer, Hermann; and Polacek, Ivo, to E. R. Squibb & Sons, Inc. 4-(1,2,4-Oxadiazolylformamidoalkyl)phenylsulfonyl ureas. 3,969,365, Cl. 260-307.00G.

Bridgewater, Martin: *See*—
Oakes, Thomas Francis; and Bridgewater, Martin, 3,968,561.

Briggs & Stratton Corporation: *See*—
Gordon, Douglas; and Seilenbinder, Richard W., 3,968,854.

Briggs, Walton E., to Varian Associates. Method and apparatus for preparing a mass spectrometer leak detector system for operation. 3,968,675, Cl. 73-1.00G.

Bright, Hugh H.; Davis, Lee W.; and Stanaszek, Frank J., to Little Giant Corporation. Process cooled submersible pump and motor assembly. 3,969,043, Cl. 417-366.000.

Brikenshtein, Khaim-Mordkhe Aronovich: *See*—
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,969,429.

Briscoe, Woodrow H. Safety container for medicine bottles and the like. 3,968,871, Cl. 206-1.500.

British Broadcasting Corporation: *See*—
Roberts, Alan, 3,969,716.

British Hovercraft Corporation Limited: *See*—
Crewe, Peter Rowland, 3,968,852.

British Petroleum Company Limited, The: *See*—
Camilleri, Michael; Usher, Michael Terence; and Wilson, Mark Beresford, 3,969,664.

British Steel Corporation, The: *See*—
Cornforth, Alexander Rankin; and Trigg, Peter John, 3,968,681.

Britton, Ronald W.: *See*—
Kupchan, S. Morris; and Britton, Ronald W., 3,969,369.

Brodie, James A. Wax applicating device. 3,969,025, Cl. 401-2.000.

Brodmann, George L.: *See*—
Moses, Dudley K.; and Brodmann, George L., 3,969,072.

Brookfield, Richard A. Sealed container with a sterilized hypodermic needle within it and method for effecting the sealing thereof. 3,968,876, Cl. 206-365.000.

Brooks, Charles R. Lantern support apparatus. 3,969,620, Cl. 240-7.500.

Brown, Clayton S.; and Jacobs, Joseph. Handhole to receive and locate connections of underground secondary electrical power cable terminations. 3,968,601, Cl. 52-21.000.

Brown, Clifford: *See*—
Spotts, Willard; and Brown, Clifford, 3,969,645.

Brown, David J.: *See*—
Sayce, John G.; and Brown, David J., 3,969,280.

Brown, Ivan Godfrey Oliver: *See*—
Clark, Donald George; and Brown, Ivan Godfrey Oliver, 3,968,548.

Brown, Loy G. Medical emergency treatment cabinet. 3,969,006, Cl. 312-234.100.

Brown, Richard N., to General Electric Company. Coffeemaker. 3,968,740, Cl. 99-289.00R.

Brown, Robert W.; Hunter, Byron A.; and Barrows, Franklin H., to Uniroyal Inc. Preparation of hydrazodicarbonamide. 3,969,466, Cl. 260-554.000.

Brown, Stanley Monty; and Wallace, David Nelson, to W. R. Grace & Co. Process for preparing phosphated alumina extrudates. 3,969,273, Cl. 252-435.000.

Browning, Gordon D. Quality control monitor. 3,969,228, Cl. 209-73.000.

Broxterman, David F.: *See—*
Sirocka, Richard L.; and Broxterman, David F., 3,969,719.

Bruhlmeier, Josef, to Luwa AG. Air outlet apparatus. 3,968,936, Cl. 239-550.000.

Brunner, Josef Klemens. Process for recovery of carboxylic acids from the waste salt solutions of cyclohexanone manufacture. 3,969,465, Cl. 260-527.00R.

Bryan, Robin R. Device for preventing unauthorized access to permanent ladders. 3,968,857, Cl. 182-106.000.

Buchel, Karl Heinz: *See—*
Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, 3,969,522.

Buckethal, Paul J., to Globe-Union Inc. Injection mold control system. 3,969,055, Cl. 425-145.000.

Buckler, Ernest Jack: *See—*
Lasis, Evalds; and Buckler, Ernest Jack, 3,969,330.

Buffalo Brake Beam Company: *See—*
Wolicki, Richard J., 3,969,032.

Buhrer, Erwin. Molding apparatus for compressing and vibrating foundry molds. 3,968,830, Cl. 164-196.000.

Bunker Ramo Corporation: *See—*
Bauer, Anton Ernst, 3,969,012.
Holt, Harley Raymond, 3,968,555.

Burford, Milton K.; Mattis, Joseph F.; Gratton, Peter D.; Donahue, William J.; Halling, Michael A.; Pinkerton, Ken; Cammack, Thomas A.; Bernardin, Rodney A.; Johnson, Lee; Lohmann, Art; and Abt, Ed, to United States of America, Navy. Target discriminating bomblet. 3,968,748, Cl. 102-7.200.

Burg, Karlheinz: *See—*
Wolters, Ernst; Schmidt, Heinz; Burg, Karlheinz; and Sextro, Gunter, 3,969,292.

Burke, Roger A.: *See—*
Clemmer, Paul J.; and Burke, Roger A., 3,968,640.

Burki, Hagues, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Watch-movement frame with extra holes for using different escapement mechanisms. 3,968,642, Cl. 58-59.000.

Burnham, Robert D.: *See—*
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 3,969,686.

Burns, Robert; and Johnson, Alan Edward, to Fibreglass Limited. Sizing of glass fibers using aqueous dispersions of film-forming copolymer of 90 percent by weight vinyl acetate with quaternary ammonium salt derivative of acrylic acid comonomer. 3,969,299, Cl. 260-29.6HN.

Burpitt, Robert D.; Pond, David M.; and Dickerson, Mary E., to Eastman Kodak Company. 2,3-Dihydro-3,3-dimethyl-2,5-benzofurandiol from isobutyraldehyde and benzoquinone. 3,969,372, Cl. 260-346.20R.

Burroughs Corporation: *See—*
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Sims, Dewey M., Jr., 3,969,600.

Bush, Stephen Frederick: *See—*
Shires, Michael John; and Bush, Stephen Frederick, 3,969,449.

Butman, Jerry; and Grettenberg, Thomas L., to Applied Systems Laboratories. Pool alarm. 3,969,712, Cl. 340-261.000.

Buxton, Incorporated: *See—*
Corey, Donald W., 3,968,874.

C.E.R.P.H.A.: *See—*
Godfroid, Jean Jacques; and Thuillier, Jean Eugene, 3,969,529.

C. Evans & Sons Limited: *See—*
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Cable Climber Safety Devices, Incorporated: *See—*
McElroy, Robert C., 3,968,865.

Cabot Corporation: *See—*
Acuncius, Dennis S.; and Matthews, Steven J., 3,969,111.

Cachera, Pierre Charles, to Electricite de France (Service National). Apparatus for the removal of after heat in a sodium-cooled fast reactor. 3,968,653, Cl. 60-644.000.

Cairns, James Anthony; Nelson, Richard Stuart; and Pugh, Stanley Frederick, to United Kingdom Atomic Energy Authority. Apparatus for purifying exhaust waste gases. 3,969,082, Cl. 23-288.0FC.

Calcagno, Piero, to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA. Selective transmission of prerecorded voice signals to subscribers of time-sharing telecommunication system. 3,969,587, Cl. 179-15.0AT.

Caldwell, Victor L. Mail box rotatable signal. 3,968,928, Cl. 232-35.000.

Calspan Corporation: *See—*
Wang, Lawrence K., 3,969,076.

Camerman, Philippe Jean Andre: *See—*
d'Ostrowick, Pierre Marie Joseph Ghislain de Radzitzky; and Camerman, Philippe Jean Andre, 3,969,421.

Camilleri, Michael; Usher, Michael Terence; and Wilson, Mark Beresford, to British Petroleum Company Limited, The. Monitor systems. 3,969,664, Cl. 318-565.000.

Cammack, Thomas A.: *See—*
Burford, Milton K.; Mattis, Joseph F.; Gratton, Peter D.; Donahue, William J.; Halling, Michael A.; Pinkerton, Ken; Cammack, Thomas A.; Bernardin, Rodney A.; Johnson, Lee; Lohmann, Art; and Abt, Ed, 3,968,748.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
MacHattie, Lloyd E., 3,968,685.

Canadian Patents and Development Limited: *See—*
Capes, Charles E.; McIlhinney, Allan E.; and Puddington, Ira E., 3,969,103.
Harmathy, Tibor Z., 3,968,841.
Lucas, Bernard H.; and Ritcey, Gordon M., 3,969,476.
Oloman, Colin William; and Watkinson, Alan Paul, 3,969,201.
Sumner, Arthur K.; Leinan, Linda M.; and Youngs, Clarence G., 3,969,539.
Thornber, William; and Wrangham, Brian, 3,969,454.

Canon Denshi Kabushiki Kaisha: *See—*
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Canon Kabushiki Kaisha: *See—*
Ogawa, Haruo, 3,968,598.
Tsuneda, Terukuni, 3,969,238.

Canonne, Jacques Edmond Marie, to Soreat S.A. Method for candying chewing-gum slabs. 3,969,513, Cl. 426-5.000.

Capes, Charles E.; McIlhinney, Allan E.; and Puddington, Ira E., to Canadian Patents and Development Limited. Method of producing ball agglomerated particulate material. 3,969,103, Cl. 75-3.000.

Capps, Cecil W.: *See—*
Berkau, Eugene E.; and Capps, Cecil W., 3,969,324.

Cappuyns, Joseph Marie: *See—*
Smolderen, Albert Emiel; and Cappuyns, Joseph Marie, 3,968,926.

Carandang, Carmen Maneclang; and Dychdala, George Roman, to Pennwalt Corporation. Low foaming acid-anionic surfactant sanitizer compositions. 3,969,258, Cl. 252-106.000.

Carder Industries, Inc.: *See—*
Carder, William E., 3,969,564.

Carder, William E., to Carder Industries, Inc. Method of seaming carpets and tape used therefor. 3,969,564, Cl. 428-212.000.

Carfagno, Angelo J., to L. H. Shingle Company. Safety latch. 3,968,988, Cl. 294-82.00R.

Carl-Art, Inc.: *See—*
Williams, Francis E., 3,968,661.

Carlston, Richard C., to United States of America, Energy Research and Development Administration. Growth of mercuric iodide single crystals from dimethylsulfoxide. 3,969,182, Cl. 156-621.000.

Carpenter, Edwin A., to Allied Tool Products, Inc. Cutting tool. 3,968,549, Cl. 29-95.00R.

Carter, John L.; and McGowan, Joseph, to United States of America, Army. Passive microwave power distribution systems. 3,969,693, Cl. 333-98.00S.

Cartwright, Patrick E. Molded plastic beehive. 3,968,531, Cl. 6-1.000.

Carver, Earl Randy, to Raymond Lee Organization, Inc., The, a part interest. Drum type musical instrument. 3,968,718, Cl. 84-422.00R.

Casco, Ernest L.; and Kosic, Ralph F., to General Dynamics Corporation. Oceanographic apparatus. 3,968,954, Cl. 254-186.00R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, 3,969,363.

Castellan, Arsenio: *See—*
Faletti, Franco; Giordano, Nicola; Marinozzi, Paolo; Bart, Joannes; and Castellan, Arsenio, 3,969,390.

Castellion, George Augustus: *See—*
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Catalyst Research Corporation: *See—*
Collins, William H.; Blucher, Richard L.; and Evans, Edward R., 3,969,154.

Catania, Patrick N.; and King, James C., to University of the Pacific. Dressing and method for treating a wound. 3,969,498, Cl. 424-28.000.

Catarious, Joseph; Bethke, Lyman; and Berman, Richard, to Alphamedics Mfg. Corporation. Dual channel photo-optical clot detection apparatus. 3,969,079, Cl. 23-253.00R.

Caterpillar Tractor Co.: *See—*
Anderson, Arlynn Wesley, 3,969,050.
Mangus, Ervin E.; Kizer, Richard W.; and Young, D. Craig, 3,968,834.
Myers, Jimmy Dale, 3,968,731.
Shotwell, Daniel B., 3,968,843.

Catto, Kenneth A., to Telephonax, Inc. Interbiased double tape spool assembly. 3,968,941, Cl. 242-193.000.

Caunt, Anthony David, to Imperial Chemical Industries Limited. Olefine polymerization catalyst incorporating an organo-phosphorus compound. 3,969,269, Cl. 252-429.00B.

Cavallari, Pier Giuseppe, to Honeywell Information Systems Italia. Two-track bidirectional cassette head for data handling apparatus. 3,969,770, Cl. 360-121.000.

Cavazza, Claudio, to Sigma-Tau. Device, provided with a puncher and a dripper, for the hermetic sealing of containers. 3,968,872, Cl. 206-222.000.

Cederquist, Karl Nicolaus, to Defibrator AB. Digestion odor control. 3,969,184, Cl. 162-19.000.

Celamerck GmbH & Co. KG: *See—*
Becher, Heinz Manfred; and Sehring, Richard, 3,969,403.
Becher, Heinz Manfred; and Sehring, Richard, 3,969,404.

Celanese Corporation: *See—*
Conciatori, Anthony B.; and Jones, Rufus S., Jr., 3,969,325.
Forschirm, Alex S., 3,969,075.
Kalnin, Ilmar L.; and Helminiak, Thaddeus E., 3,969,430.
Reader, Arthur M., 3,969,394.

Cellarius-Haigermoser, Herta, legal representative: *See—*
Sturm, Elmar; and Cellarius, Hans Jorg, deceased, 3,969,367.

Cellarius, Hans Jorg, deceased: *See—*
Sturm, Elmar; and Cellarius, Hans Jorg, deceased, 3,969,367.

Cenker, Moses; and Kan, Peter T., to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams prepared from acid-modified toluene diisocyanate. 3,969,288, Cl. 260-2.5BF.

Cerbo, Thomas A., to Potters Industries Inc. Method and apparatus for separating particulate material. 3,969,224, Cl. 209-12.000.

Ceskoslovenska akademie ved: *See—*
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Chadwick, Donald Thornton; and Kuhfus, Gerd, to Northern Electric Company Limited. Light emitting diode indicator assembly for a multiple pushbutton array. 3,969,721, Cl. 340-381.000.

Chafetz, Harry: *See—*
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Chaffin, John D. Apparatus and method for geological drilling and coring. 3,968,845, Cl. 175-60.000.

Chaires, Anne Marie: *See—*
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Chenausky, Peter P.; and Freiberg, Robert J., to United Technologies Corporation. Enhanced radiation coupling from unstable laser resonators. 3,969,685, Cl. 331-94.50C.

Cherney, Dale M.; Hart, Charles G.; and Safranski, Richard W., to Hayssen Manufacturing Co. Digital weighing apparatus. 3,968,848, Cl. 177-123.000.

Chervenka, Charles H., to Beckman Instruments, Inc. Alignment of centrifuge cells and counterbalances. 3,968,557, Cl. 29-271.000.

Chevalier, Donald M. Apparatus responsive to solar energy for producing power. 3,968,652, Cl. 60-641.000.

Chevron Research Company: *See—*
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Walgenbach, David D.; and Stocker, Kenneth E., 3,968,771.
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Chika, John J. Auxilliary body restraining device. 3,968,994, Cl. 297-390.000.

Chinoin Gyogyszer es Vegyeszeti: *See—*
Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Nagy, Gabor; David, Agoston; Bognar, Rezso; Makleit, Sandor; and Valovics, Gyula, 3,969,519.

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Cho, Alfred Yi; and Tracy, Joseph Charles, Jr., to Bell Telephone Laboratories, Incorporated. Native oxide technique for preparing clean substrate surfaces. 3,969,164, Cl. 148-175.000.

Chodil, Gerald Joseph; DeJule, Michael C.; and Glaser, David, to Zenith Radio Corporation. Gas discharge display device and a novel hollow cathode therefor. 3,969,650, Cl. 315-169.0TV.

Chubu Seiko Kabushiki Kaisha: *See—*
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Chugairo Kogyo Kaisha Ltd.: *See—*
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Chung, Hui Do. Process for dyeing yarn hanks. 3,969,074, Cl. 8-155.200.

Ciba-Geigy AG: *See—*
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Ciliberti, David F.; and Scala, Luciano C., to United States of America, Interior. Method for casting and handling ultra-thin reverse osmosis membranes. 3,969,452, Cl. 264-41.000.

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Cizek, Jaroslav: *See—*
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Clark, Donald George; and Brown, Ivan Godfrey Oliver, to AMP Incorporated. Lead transfer mechanism. 3,968,548, Cl. 29-33.00M.

Clark Equipment Company: *See—*
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Clark, Herbert D., to Universal Oil Products Company. Corrosive inhibitor compositions. 3,969,260, Cl. 252-147.000.

Clark, James L.: *See—*
Johnston, Ray H.; Mather, Bryon L.; and Clark, James L., 3,968,925.

Clark, Kenneth K., to Geophysical Research Corporation. Gauge for remotely indicating the pressure of a subterranean formation. 3,968,694, Cl. 73-398.00C.

Clark, Melville, Jr.; and Luce, David A., to Clark, Melville, Jr. Musical instrument with means for scanning keys. 3,968,716, Cl. 84-1.130.

Clark, Melville, Jr.; and Luce, David A., to Clark, Melville, Jr. Musical instrument with means for scanning keys. 3,968,717, Cl. 84-1.190.

Clarke, David Bernard Swann: *See—*
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Clegg, Giles C., Jr.: *See—*
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Cleland, Charles E., to Continental Machines, Inc. Vibration resistant band saw wheel. 3,968,715, Cl. 83-820.000.

Clemens, Jon Kaufmann: *See—*
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Clemmer, Paul J.; and Burke, Roger A., to Hughes Aircraft Company. Digital watch with elastomer housing block and flexible printed circuitry. 3,968,640, Cl. 58-50.00R.

Clevepak Corporation: *See—*
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Coffey, John Albert, to Quantel, Limited. Sampling phase identification apparatus. 3,969,760, Cl. 358-8.000.

Coffin, Perley A.; Cook, Philip G.; and Demerjian, Paul D., to General Latex and Chemical Corporation. One-part foamable latex composition. 3,969,289, Cl. 260-2.50L.

Cogez, Paul: *See—*
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Cole, James B., to Boeing Company, The. Extendable aerodynamic fairing. 3,968,946, Cl. 244-42.00D.

Coleman, Berta W. Battery saving key chain. 3,968,669, Cl. 70-456.00R.

Colgate-Palmolive Company: *See—*
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Colle, Jan, to U.C.B., Societe Anonyme. Continuous process for drying sodium vinyl-sulfonate. 3,969,400, Cl. 260-513.00R.

Collins, William H.; Blucher, Richard L.; and Evans, Edward R., to Catalyst Research Corporation. Catastrophic failure of metals. 3,969,154, Cl. 148-9.00R.

Colston, John R.: *See—*
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Combustion Engineering, Inc.: *See—*
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Communications Satellite Corporation (Comsat): *See—*
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Compagnie Europeenne de Teletransmission (C.E.T.T.): *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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Computervision Corporation, The: *See—*
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Conciatori, Anthony B.; and Jones, Rufus S., Jr., to Celanese Corporation. Production of particulate BBB type polymer having an unusually high surface area. 3,969,325, Cl. 260-78.410.

Conlon, Daniel R. Stabilizing means for laboratory ware. 3,969,080, Cl. 23-259.000.

Connelly, George F., Jr. Pipe cleaning composition. 3,969,255, Cl. 252-87.000.

Conrad, Horst: *See—*
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Container Corporation of America: *See—*
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Continental Can Company, Inc.: *See—*
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Continental Machines, Inc.: *See—*
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Continental Oil Company: *See—*
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Corey, Donald W., to Buxton, Incorporated. Convertible cigarette case. 3,968,874, Cl. 206-248.000.

Cornelius Company, The: *See—*
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Cornelius, Richard T., to Cornelius Company, The. Method for dispensing a semi-frozen comestible. 3,969,531, Cl. 426-319.000.

Cornforth, Alexander Rankin; and Trigg, Peter John, to British Steel Corporation, The. Testing articles. 3,968,681, Cl. 73-67.50R.

Corrons, Bill E.; and Barker, James F., to General Dynamics Corporation. Dual diode oscillator and airstrip transmission line apparatus. 3,969,689, Cl. 331-107.00R.

Cosden Technology, Inc.: *See—*
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Coudrin, Rolande: *See—*
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Coupek, Jiri: *See—*
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Cournoyer, Georges A. Musical keys and intervals teaching device. 3,968,722, Cl. 84-473.000.

Couvillon, James Benedict; Daniels, William Dorsey; Gassner, Ronald Lee; and Maher, Robert Allen, to United States of America, Transportation. Distance measuring equipment. 3,969,725, Cl. 343-6.50R.

Cover, John H., Jr.: *See—*
Jenkins, Robert K.; Keller, Leon B.; and Cover, John H., Jr., 3,969,731.

Crabbe, Pierre; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 16,17-Seco-delta 4,9(10) and -delta 4,9(10),11 steroids. 3,969,412, Cl. 260-586.00E.

Craig, John William Thomas: *See—*
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Cremer, Dieter: *See—*
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Crewe, Peter Rowland, to British Hovercraft Corporation Limited. Stabilizing means for air cushion vehicles. 3,968,852, Cl. 180-118.000.

Criswell, Larry Grant, to Abbott Laboratories. Method of separating and recovering soluble proteins from protein containing solutions employing foam fractionation. 3,969,336, Cl. 260-112.00R.

Croissant, Pierre; and Coudrin, Rolande, to SAFT-Societe des Accumulateurs Fixes et de Traction. Gelled alkaline electrolyte. 3,969,147, Cl. 136-157.000.

Crombie, Dean H.: *See—*
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Calcagno, Piero, 3,969,587.

Cuff, Calvin I. Device for converting rotary motion into a unidirectional linear motion. 3,968,700, Cl. 74-84.00S.

Cunningham, John: *See—*
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Cunningham, Ross: *See—*
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Curtil, Marcel. Wristwatch case and wristlet assembly. 3,968,643, Cl. 58-88.00R.

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Cushing, Donald S.: *See—*
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D.G. Rung Industries, Inc.: *See—*
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Dach, Hansjorg, to Zahnradfabrik Friedrichshafen AG. Hydraulic speed-changing system. 3,968,707, Cl. 74-869.000.

Dagnaux, Jean G.: *See—*
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Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, to Astra Lakemedel Aktiebolag. Polymers of hydroxy carboxylic acid and a polyhydric alcohol. 3,969,395, Cl. 260-484.00R.

Daimler-Benz Aktiengesellschaft: *See—*
Dobler, Helmut; Nadolny, Kurt; Zeilinger, Karl; Lamm, Heinz; and Piry, Horst, 3,969,048.
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Dale, John D.; and Knotter, David G. Lightweight portable scale. 3,968,849, Cl. 177-127.000.

Dalenberg, Paul N.: *See—*
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D'Amico, John J.; and Mullins, Darrell D., to Monsanto Company. Base catalysis of azolesulfenamides and sulfur to aminodithioazoles. 3,969,350, Cl. 260-247.10H.

Dammann, Hans, to U.S. Philips Corporation. Method of image enhancement. 3,969,017, Cl. 350-162.0SF.

Danco, William J.; and Given, Arthur P., to General Electric Company. Method and apparatus for operator interrogation of simulated control circuits. 3,969,722, Cl. 340-172.500.

Danell, Russell D., to James B. Carter Limited. Thermal pulse type heater for coolant systems and the like. 3,969,605, Cl. 219-208.000.

Daniels, William Dorsey: *See—*
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Danin, Alex. Vehicle barriers. 3,968,596, Cl. 49-49.000.

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Dantowitz, Edward, to Albany Novelty Mfg. Co. Apparatus for manufacturing a plastic name tag holder. 3,969,063, Cl. 425-520.000.

D'Aquanni, Cesare A., to Raymond Lee Organization, Inc., The, a part interest. Racquet with two independently strung faces. 3,968,966, Cl. 273-73.00D.

Dart Environment and Services Company: *See—*
Kruse, David C., 3,969,242.

da Silva, Herman: *See—*
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Data Packaging Corporation: *See—*
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Daumas, Jean-Claude; and Le Page, Madeleine, to Rhone-Progil. Process for oxychlorination of hydrocarbons. 3,969,424, Cl. 260-662.00A.

Davenport, Clyde M.: *See—*
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David, Agoston: *See—*
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Davis, Charles C., to Uarco Incorporated. Burster. 3,968,916, Cl. 225-100.000.

Davis, Charles W., to Stanadyne, Inc. Fuel injection pump and injection control system therefor. 3,968,779, Cl. 123-140.0FG.

Davis, Frederick, to RPR, Inc. Cholesteric liquid crystal water base ink. 3,969,264, Cl. 252-299.000.

Davis, Lee W.: *See—*
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Davis, Robert C.: *See—*
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Davitt, H. James: *See—*
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Day, Joseph M. Viscous liquid conveying apparatus. 3,969,608, Cl. 219-300.000.

Dayco Corporation: *See—*
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De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
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de Beuckelaer, Gerard; Krome, Gerd; Langens, Jan; Lockefeer, Ferdinand; and Schaerlaekens, Paul, to BASF Aktiengesellschaft. Production of hydrogen chloride by thermal dissociation of organic substances containing chlorine. 3,969,490, Cl. 423-481.000.

Debortoli, George; Chase, Peter McGivery; and Lukas, Helmut H., to Northern Electric Company Limited. Loading coil assemblies for communications cables. 3,969,580, Cl. 178-46.000.
Deeg, Emil W.: *See—*
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Deelen, Antonius Maria, to Nederlandsche Wapen- en Munitiefabriek "De Kruithoorn" B.V. Projectile-case connection. 3,968,750, Cl. 102-41.000.
Deere & Company: *See—*
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Deichsel, Klaus; Flessner, Hinrich; and Tromp, Henricus Theodorus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Disc brake, especially for crane drives. 3,968,864, Cl. 188-71.900.
DeJule, Michael C.: *See—*
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Delicheres, Francois: *See—*
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Deltrol Corporation: *See—*
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DeLuca, Paul V.; Gazzo, John J., Jr.; Santulli, Vincent F.; Siegel, Errol; and Mannino, Vito, to Porta Systems Corporation. Automated telephony testing and polling apparatus and system. 3,969,594, Cl. 179-175.30R.
Demarteau, Willy: *See—*
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Demerjian, Paul D.: *See—*
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DeMoss, Richard A.; and Hilton, Howard T., to International Business Machines Corporation. Sub-harmonic phase control for an ink jet recording system. 3,969,733, Cl. 346-1.000.
de Munck, Eduard Herman Louis, to International B. F. Goodrich-Europe B.V. Dilation joint strip. 3,968,611, Cl. 52-396.000.
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Deutsch, Ernst; and Reifenscheid, Bernhard, to Chemische Werke Huls Aktiengesellschaft. Assembly for forming a structure having generally curved surfaces. 3,968,609, Cl. 52-245.000.
Deutsche Edelstahlwerke Aktiengesellschaft: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
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de Witte, Olivier; Eranian, Armand; and Dezauzier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method for reducing the width of a laser pulse and a corresponding double-resonator laser. 3,969,684, Cl. 331-94.50C.
Dexter, Martin; and Peterson, Janet B., to Ciba-Geigy Corporation. Fat compositions stabilized with esters of fatty acids and tertiary lower alkyl substituted hydroquinones and method therefrom. 3,969,383, Cl. 260-410.500.
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Dhaka, Vir A.; and Krolikowski, Walter F., to International Business Machines Corporation. Diffused junction capacitor and process for producing the same. 3,969,750, Cl. 357-14.000.
Diamond, Julius; and Santora, Norman J., to William H. Rorer, Inc. D-aminophenylacetic acid compounds and derivatives. 3,969,401, Cl. 260-518.00A.
Dickerson, Mary E.: *See—*
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DiTullio, Nicholas W.; Lowman, Charles P.; Maass, Alfred R.; and Saunders, Harry L., to SmithKline Corporation. Lowering the concentration of plasma triglycerides. 3,969,508, Cl. 424-275.000.
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Doyle, Timothy K., to Ford Motor Company. Vehicle seat assembly. 3,968,993, Cl. 297-355.000.
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Driscoll, Gary L., to Sun Ventures, Inc. Method of manufacturing a foam fibrillated fibrous web from an isotactic polypropylene, polystyrene and α-methylstrene blend. 3,969,472, Cl. 264-50.000.
Driussi, Conrad, to United States of America, Navy. Electron beam ionization signal sampler. 3,969,676, Cl. 328-121.000.
Drukaroff, Israel; and Morren, Wally, to RCA Corporation. Light shield for a semiconductor device comprising blackened photoresist. 3,969,751, Cl. 357-30.000.
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Emodi, Alexander S.; Newmark, Harold Leon; and Scialpi, Leonard Joseph, to Hoffmann-La Roche Inc. Stable amoxicillin dosage form. 3,969,524, Cl. 424-271.000.

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Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method of producing guanosine by fermentation. 3,969,188, Cl. 195-28.00N.

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Faris, Gordon J. Clearance monitoring probe for rotary regenerative heat exchanger. 3,968,569, Cl. 33-169.00R.

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Favreau, Michel, to Thomson-CSF. Secam color television receivers employing tunable notch filter in luminance channel. 3,969,762, Cl. 358-38.000.

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Ferrell, Richard M., to Ford Motor Company. Motor vehicle light assembly utilizing total internal reflection. 3,969,621, Cl. 240-41.35C.

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Frampton, Orville D., to National Distillers and Chemical Corporation. Fixed bed catalyst. 3,969,274, Cl. 252-456.000.

Frank, Hermann; and Degenhardt, Karl-Heinz, to Hoechst Aktiengesellschaft. Apparatus for producing a developer medium for diazotype materials. 3,969,741, Cl. 354-299.000.

Frank, Pierre: *See—*
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Franke, Walter, to Motoren Forschungs GmbH & Co. KG Franken Motoren. Internal combustion engine. 3,968,777, Cl. 123-44.00R.

Franklin, Grover C., Jr. Apparatus and method for aerating liquids. 3,969,446, Cl. 261-87.000.

Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See*—
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Freiberg, Robert J.; and McLafferty, George H., to United Technologies Corporation. Standing wave unstable resonators for radial flow lasers. 3,969,687, Cl. 331-94.50C.

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Freiberg, Robert J.: *See*—
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Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Naphthylmethyl sulfonium compounds. 3,969,414, Cl. 260-607.00B.

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Fritsch, Rudolf Paul. Process and apparatus for the continuous production of vulcanizable mixtures. 3,968,955, Cl. 259-192.000.

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Fujii, Kinjiro; and Kondo, Wakichi, to Agency of Industrial Science & Technology. Thermochemical process for manufacture of hydrogen and oxygen from water. 3,969,493, Cl. 423-579.000.

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Fukaya, Hirokazu, to Nippon Electric Company, Ltd. Deflection circuit for television receiver set or the like. 3,969,653, Cl. 315-403.000.

Fukuba, Kozo; and Ogushi, Yasutomo, to Sumitomo Chemical Company, Limited. Intumescent fire-retardant coating compositions containing amide-polyphosphates. 3,969,291, Cl. 260-17.300.

Fukuda, Takashi; Ishizaki, Nobuo; Iwahori, Shoichi; and Shimada, Masayoshi, to Toyobo Co., Ltd. Process for preparing active carbon fibers. 3,969,268, Cl. 252-423.000.

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Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Manifold reactor for an automobile. 3,968,648, Cl. 60-282.000.

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Gaeddert, Melvin Victor; and McWhirt, Bobby Dwayne, to Hesston Corporation. Round bale forming machine for light crop materials. 3,968,633, Cl. 56-341.000.

Gaillochet, Jean R., to Marinoni. Automatic device for the remote adjustment of the inking blade of a printing machine. 3,968,746, Cl. 101-365.000.

Galantay, Eugene E., to Sandoz, Inc. 1-(2-Naphthyl)-2,3-butadien-1-ols. 3,969,415, Cl. 260-613.00D.

Gallagher, Ruth E., to Stauffer Chemical Company. Reinforcement of vinyl chloride resins with suspension emulsion interpolymers. 3,969,431, Cl. 260-876.00R.

Gallo, George T. Combination support and guard for a toothbrush. 3,968,950, Cl. 248-359.000.

Gambill, Charles C., to General Motors Corporation. Electronic internal combustion engine ignition spark vacuum and speed advance system with ignition dwell time directly proportional to engine speed. 3,968,778, Cl. 123-117.00R.

Gannet Holdings Limited: *See*—
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Garris, Charles R., to SmithKline Corporation. Photoelectric inspection of transparent or translucent medicinal capsules. 3,969,227, Cl. 209-73.000.

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Gaskill, Charles David Sinclair, to International Electronics Limited. Electromagnet weighing balance. 3,968,850, Cl. 177-210.000.

Gasman, Robert C., to Kendall Company, The. Selected lipophilic aminimides and polymers derived therefrom useful for making stable emulsions. 3,969,298, Cl. 260-29.6HN.

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Gaug, John R. Molded steel rule die for rotary die cutting. 3,969,474, Cl. 264-219.000.

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Geissler, Rolf, to Auergesellschaft GmbH. Clamping ring for the window frame of a breathing mask. 3,968,793, Cl. 128-141.00R.

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Gerritsen, Gerrit Berend; and van Rosmalen, Gerard Eduard, to U.S. Philips Corporation. Opto-electronic focus detection system. 3,969,575, Cl. 178-6.60R.

Gerster, John F., to Riker Laboratories, Inc. N-methylene malonate of tetrahydroquinoline and derivatives thereof. 3,969,463, Cl. 260-287.00T.

Gertsch, Georges-Albert, to Micafil A.G. Protective circuit arrangement for capacitor voltage transformers. 3,969,655, Cl. 317-12.00A.

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Giacoletti, John B.; Ryding, Thomas C.; and Zetye, Walter C., to General Motors Corporation. Fuel tank. 3,968,896, Cl. 220-63.00R.

Gidewall, Kenneth L.; and Heavner, Larry W., to CVP Systems, Inc. Packaging apparatus. 3,968,629, Cl. 53-373.000.

Gill, Charles L., to Harris, Beach & Wilcox; and Pelino, Angelo, part interest to each. Lens blocking tools. 3,968,599, Cl. 51-216.0LP.

Gillette Company, The: *See—*
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Globe-Union Inc.: *See—*
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Godbersen, Byron L. Apparatus for handling bales. 3,968,940, Cl. 242-86.50R.

Godfroid, Jean Jacques; and Thuillier, Jean Eugene, to C.E.R.P.H.A. Phenoxyacetic acid derivatives as diuretic agents. 3,969,529, Cl. 424-275.000.

Golda, Inc.: *See—*
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Goncalves, Antonin, to Societe Anonyme dite: L'Oreal. Container assembly. 3,968,914, Cl. 224-45.0AA.

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Gordon, Douglas; and Seilenbinder, Richard W., to Briggs & Stratton Corporation. Low noise level muffler for small engines. 3,968,854, Cl. 181-40.000.

Gordon, Joseph; and Sukornick, Bernard, to Allied Chemical Corporation. Process for synthesis of chlorodiflyuoroamine. 3,969,486, Cl. 423-351.000.

Gorges, Franz A.; and Robertson, James E., to Menasco Manufacturing Company. Kinetic energy absorbing value assembly. 3,968,862, Cl. 188-1.00C.

Gorski, Daniel A., to Aeronutronic Ford Corporation. Protective coating for IV-VI compound semiconductor devices. 3,969,743, Cl. 357-4.000.

Gorter, Frederik Willem; and Potgiesser, Jan Antoon Ludolf, to U.S. Philips Corporation. Magneto-resistive head. 3,969,769, Cl. 360-113.000.

Gosling, Harold William, to National Research Development Corporation. Single side-band radio. 3,969,675, Cl. 325-50.000.

Gostling, Peter Eric, to C. Evans & Sons Limited. Decking beam assembly. 3,968,616, Cl. 52-645.000.

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Greek, John Charlie, Jr.; Petterson, Eric Sigfried; Tanner, Howard Carl; and Terry, David Wesley, to International Business Machines Corporation. Format control system for positioning final copy printed text. 3,968,868, Cl. 197-19.000.

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Greeson, James C., Jr., to International Business Machines Corporation. Display system. 3,969,651, Cl. 315-169.0TV.

Greiller, Jack F., to Eastman Kodak Company. Curtain coating apparatus. 3,968,772, Cl. 118-325.000.

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Grevstad, Paul E.; and Gelting, Raymond L., to United Technologies Corporation. Fuel cell cooling system using a non-dielectric coolant. 3,969,145, Cl. 136-86.00R.

Griese, Hans-Joachim; Warning, Paul-Friedrich; and Wichmann, Klaus-Hinrich, to Sennheiser Electronic. Method of stereophonic recording. 3,969,583, Cl. 179-1.00G.

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Grigull, Hans, to Leybold-Heraeus GmbH & Co. KG. Production of plastic-filler mixtures. 3,969,314, Cl. 260-42.000.

Grimm, Oskar; Vorgrimler, Ludwig; and Bernhard, Peter, to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft. Cartridge receiving drum construction for gas-tight closure between the drum and the adjacent gun barrel. 3,968,726, Cl. 89-26.000.

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Gros, Chajim. Apparatus and method for manufacturing resilient bands. 3,968,710, Cl. 83-18.000.

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Guth, Lauren W., to General Electric Company. Door latch. 3,968,984, Cl. 292-229.000.

Gutman, Arnold D., to Stauffer Chemical Company. Thioalkyl phosphonates. 3,969,441, Cl. 260-948.000.

Gutman, Arnold D., to Stauffer Chemical Company. O(S)(NH) Trifluoromethyl-aryl phosphonates. 3,969,443, Cl. 260-955.000.

Gyurik, Robert J.; and Kingsbury, William D., to SmithKline Corporation. Anthelmintic 5-heterocyclothio and oxy-2-carbalkoxyaminobenzimidazles. 3,969,526, Cl. 424-273.000.

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Berets, Donald Joseph; Castellion, George Augustus; and Haacke, Gottfried, 3,968,639.

Haas, Marta. Infant carrier. 3,968,911, Cl. 224-6.000.

Hadley, Harry A.; and Spector, George. Soap saver. 3,969,256, Cl. 252-92.000.

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Hahn, Werner; Hennig, Walter; and Walther, Bernhard, to VEB Pentacon-Dresden. Film cassette. 3,969,740, Cl. 354-275.000.

Haines, Delmar C. Fruit picking device. 3,968,631, Cl. 56-328.00R.

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Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing and applying apparatus. 3,968,745, Cl. 101-111.000.

Hamlin, Arthur Houser, to Du Pont de Nemours, E. I., and Company. Precision registration system for leads. 3,968,563, Cl. 29-591.000.

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Hammar, Walton James, to Riker Laboratories, Inc. 12-Anti and syn-(N-benzyl-N-alkylaminomethyl)-10,11-dihydro-5,10-methano-5H-dibenzo[*a,d*]cycloheptenes and the salts thereof. 3,969,467, Cl. 260-570.900.

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Hammer, Heiner I., to Schlegel Engineering GmbH. Method and apparatus for introducing water-proof sheeting into the ground in a vertical position. 3,968,658, Cl. 61-72.100.

Hammermill Paper Company: *See—*
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Hannay, Richard C. Method for setting or resetting poles in the ground with foamed polyurethane resin. 3,968,657, Cl. 61-53.500.

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Hansen, Kenneth P.; and Crombie, Dean H., to United Technologies Corporation. Fluid-operated apparatus exhibiting hysteresis effect. 3,968,729, Cl. 91-32.000.

Hansen, Russell W.; and Fassett, Matthew, to Raytheon Company. Radio frequency switch. 3,969,690, Cl. 333-7.00R.

Hanson, Howard N.: *See—*
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Hare, George F.: *See—*
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Harmathy, Tibor Z., to Canadian Patents and Development Limited. Flame deflecting device for mounting on a building exterior. 3,968,841, Cl. 169-48.000.

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Harpman, Webster B., to Energy Research Inc. Fuel system for internal combustion engines. 3,968,775, Cl. 123-25.00B.

Harrah, Robert E., to Microphor, Inc. Flush toilet and method. 3,968,526, Cl. 4-79.000.

Harris, Beach & Wilcox: *See—*
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Harris, John L., to Deltrol Corporation. Automatic reset timer. 3,968,698, Cl. 74-3.500.

Harris, Mack. Permanent magnet hydrogen oxygen generating cells. 3,969,214, Cl. 204-275.000.

Hart, Charles G.: *See—*
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Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, to Metallgesellschaft Aktiengesellschaft. Heat exchanger for oil deodorizing plant. 3,968,835, Cl. 165-108.000.

Hashizume, Akihide; Kohno, Hideki; and Yamamoto, Shinji, to Hitachi, Ltd. Signal separation system used for an automated classification of white blood cells. 3,969,024, Cl. 356-39.000.

Hassan, Javathu K.; Mack, Alfred; and Wojtaszek, Michael R., to International Business Machines Corporation. Method and apparatus for handling workpieces. 3,968,885, Cl. 214-1.0BC.

Hatsukano, Yoshikazu; Nomiya, Kosei; and Kawagoe, Hiroto, to Hitachi, Ltd. Digital circuit to eliminate display flicker. 3,969,717, Cl. 340-324.00M.

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Hay, Charles N., to General Motors Corporation. Occupant restraint system. 3,968,980, Cl. 280-734.000.

Hay, Peter M., to Sandoz, Inc. Flame-retardant softening agents. 3,969,231, Cl. 252-8.800.

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Hayashi, Hideyuki: *See—*
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Hayashida, Yoshihiro: *See—*
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Hayes, John C., to Universal Oil Products Company. Hydrogenation and hydrodesulfurization of hydrocarbon distillate with a catalytic composite. 3,969,222, Cl. 208-210.000.

Hayes, John C., to Universal Oil Products Company. Saturated hydrocarbon isomerization process. 3,969,425, Cl. 260-666.00R.
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Heisner, Donald N.; and Loyer, Phillip K., to Picker Corporation. System of positioning and inspecting tires. 3,969,627, Cl. 250-358.00T.
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Hemperly, Vernon C., to United States of America, Energy Research and Development Administration. High-strength ductile uranium alloy. 3,969,160, Cl. 148-32.500.
Henderson, William B., to TRW Inc. Simplified method of transistor manufacture. 3,969,165, Cl. 148-187.000.
Hendrickson, Ralph L. Drip irrigation device. 3,968,930, Cl. 239-107.000.
Hengstebeck, Robert J., to Standard Oil Company. Heat-exchanger trays and system using same. 3,969,450, Cl. 261-153.000.
Henke, Robert H. Method of producing silicon steel strip. 3,969,162, Cl. 148-111.000.
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Henrick, Clive A., to Zoecon Corporation. Ethyl 10-methoxy-3,7,11-trimethyldodeca-2,4-dienoate. 3,969,385, Cl. 260-410.90R.
Hepp, Gunter, to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung. Conveyor for transporting workpieces. 3,968,889, Cl. 214-18.00R.
Herbenar, Edward J., to TRW Inc. Joint assembly. 3,968,975, Cl. 280-95.00R.
Herber, John F.; Street, Robert W.; and Richard, William R., Jr., to Monsanto Company. Chemical compounds. 3,969,254, Cl. 252-78.000.
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Herrmann, Ernst. Safety closure cap. 3,968,894, Cl. 215-220.000.
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Horie, Noboru; and Hoya, Kazuo, to Hitachi, Ltd. Integrated multiple transistors with different current gains. 3,969,748, Cl. 357-46.000.
Horiuchi, Yasuo; and Katsube, Toraichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Powder molding process for producing thermoplastic articles. 3,969,475, Cl. 264-310.000.
Horner, James W., to GTI Corporation. Component handler with automatic sorter. 3,969,229, Cl. 209-74.00R.
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Kendrick, Edward Summers, to Eastman Kodak Company. Electronic flash unit for cameras adapted to receive flashbulbs. 3,969,737, Cl. 354-141.000.

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Lanahan, John H., to Monarch Marking Systems, Inc. Record feeding apparatus and method. 3,968,917, Cl. 226-2.000.
Landgraf, Helmut, to Mannesmann Aktiengesellschaft. Method for making a thermoplastic sleeve to be used as coupler fitting for tubes. 3,969,170, Cl. 156-158.000.
Lane, Ralph D.; and Manning, Richard A., to International Business Machines Corporation. Content-Addressable Memory capable of a high speed search. 3,969,707, Cl. 340-173.0AM.
Lanfermann, Willy; Kaisler, Paul; and Lauterbach, Dieter, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Chain drive arrangement for a mining machine. 3,968,754, Cl. 104-172.00R.
Lang, Armin; Kurz, Falk; and Walter, Wolfgang, to Zahnradfabrik Friedrichshafen AG. Hydraulic power-steering system for automotive vehicles. 3,968,733, Cl. 91-451.000.
Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Wrap-around carton forming machine. 3,968,623, Cl. 53-195.000.
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Lasis, Evalds; and Buckler, Ernest Jack, to Polysar Limited. Amine modified polymers. 3,969,330, Cl. 526-14.000.
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Leichliter, Wayne K.; Detty, Rodney H.; and Hill, John B., to Eaton Corporation. Fluid coupling. 3,968,866, Cl. 192-58.00B.
Leighton, Harold; and Gullis, William John, to Leighton, Harold. Hairbrush. 3,968,536, Cl. 15-187.000.
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Le Noane, Georges E. Cable connector for optical fiber transmission. 3,969,015, Cl. 350-96.00C.
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Mattis, Weat Carl, to Du Pont de Nemours, E. I., and Company. High density tow cartons. 3,968,877, Cl. 206-388.000.

Matulaitis, Victor E., to Ex-Cell-O Corporation. Structure for and method of electroerosion machining. 3,969,602, Cl. 219-69.00C.

Matzen, Walter Theodore: *See—*
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Matzke, William A., to Champion International Corporation. Plastic louver frame assembly. 3,968,738, Cl. 98-108.000.

Mauz, Otto; and Granzer, Ernold, to Hoechst Aktiengesellschaft. 4-Hydroxy-3,5-di-alkyl-phenyl-propionic acid composition suitable as lipid lowering and anti-diabetic agents. 3,969,530, Cl. 424-308.000.

Maximov, Fedor Spiridonovich: *See—*
Perevozkin, Jury Leibovich; Mkrtychian, Anatoly Aramovich; Baryshevsky, Leonid Mikhailovich; Livshits, Vadim Manuilovich; Meilikhov, Daniel Semenovich; Govorov, Jury Ivanovich; Beschastny, Andrei Stepanovich; and Maximov, Fedor Spiridonovich, 3,968,827.

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Mayama, Mikao: *See—*
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Mayer, Ehrhard; Findler, Ludwig; Mathes, Wolfgang; and Steigenberger, Michael. Sealing arrangement. 3,968,969, Cl. 277-15.000.

Maykut, Albert R.: *See—*
Betts, Robert E.; Thorn, Lawrence B.; and Maykut, Albert R., 3,968,646.

Mayo, James C., Sr.: *See—*
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Mazak, Milos: *See—*
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McCabe, Peter, to Addressograph Multigraph Corporation. Automatic engagement and metering adjustment controls for metering blade device. 3,969,742, Cl. 354-318.000.

McCarthy, James R., Jr.; Wysong, Don V.; and Allen, Bobbie J., to Dow Chemical Company, The. 1-Aryl-3-(2-hydroxyethyl) thioureas for treating depression. 3,969,532, Cl. 424-322.000.

McCormack, Darrell W., to Fo-Mac, Inc. Toe stop for roller skates. 3,968,973, Cl. 280-11.200.

McDonald Products Corporation: *See—*
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McElroy, Robert C., to Cable Climber Safety Devices, Incorporated. Cable climber safety lock. 3,968,865, Cl. 188-188.000.

McGill Manufacturing Company, Inc.: *See—*
Osika, Thomas F., 3,969,597.

McGlaughlin, Laurence D., to Honeywell Inc. Image dissector with many apertures for Hadamard encoding. 3,969,699, Cl. 340-146.30F.

McGlothlin, William K. Method of reinforcing tunnels before excavation. 3,968,655, Cl. 61-42.000.

McGowan, Joseph: *See—*
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McGraw-Edison Company: *See—*
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McIlhinney, Allan E.: *See—*
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McIntyre, Raymond D., to Varian Associates. X-ray treatment machine having means for reducing secondary electron skin dose. 3,969,629, Cl. 250-503.000.

McJohnson, Robert B., to Recognition Equipment Incorporated. Bar code reader enhancement. 3,969,612, Cl. 235-61.11E.

McKeighen, James F., to Kawecki Berylco Industries, Inc. Production of tapered titanium alloy tube. 3,969,155, Cl. 148-11.50F.

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Freiberg, Robert J.; and McLafferty, George H., 3,969,688.

McLoughlin, John. Protective cover for extending shafts. 3,968,824, Cl. 150-52.00R.

McNair, Richard Dale: *See—*
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McTighe, Gilbert T.; and Johansson, Sture A. Method for self-cleaning a restroom. 3,969,133, Cl. 134-21.000.

McVicker, Gary B., to Exxon Research and Engineering Company. Process for redispersion of noble metal catalysts using fluorine. 3,969,267, Cl. 252-415.000.

McWhirt, Bobby Dwayne: *See—*
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Gaeddert, Melvin Victor; and McWhirt, Bobby Dwayne, 3,968,633.

McWilliams, Gerald E., to United States of America, Navy. Device for determining the state of charge in batteries. 3,969,667, Cl. 324-29.500.

Mead Corporation, The: *See—*
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Mead, Ralph T.; Frenz, Norbert W.; and Rudolph, Frank W., to Wilson Greatbatch Ltd. Enclosure for lithium-iodine cell and method of making the same. 3,969,143, Cl. 136-83.00R.

Mead, Ralph T.: *See—*
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Medicor Muvek: *See—*
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Medow, Robert S. Facing structures for building. 3,968,610, Cl. 52-314.000.

Medtronic, Inc.: *See—*
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Meek, George W., to Aktiebolaget Carl Munters. Method of corrugating a web of thin thermoplastic material in a continuous production. 3,969,473, Cl. 264-90.000.

Mehta, Manankumar S.: *See—*
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Meier, Ernst, to Stopinc Aktiengesellschaft. Slide closure for metallurgical vessels. 3,968,909, Cl. 222-600.000.

Meilikhov, Daniel Semenovich: *See—*
Perevozkin, Jury Leibovich; Mkrtychian, Anatoly Aramovich; Baryshevsky, Leonid Mikhailovich; Livshits, Vadim Manuilovich; Meilikhov, Daniel Semenovich; Govorov, Jury Ivanovich; Beschastny, Andrei Stepanovich; and Maximov, Fedor Spiridonovich, 3,968,827.

Meiller, Francois, to Rhone-Progil. Porous substances having ion exchange properties. 3,969,261, Cl. 252-179.000.

Meise, Henry August, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Telephone switching system having attendant queuing facilities. 3,969,589, Cl. 179-27.00D.

Mello, Fabio, to Commerciale Sacea, S.a.s. Complete set of elements fitting in unit-composed supporting systems. 3,968,882, Cl. 211-189.000.

Melotik, Donald J., to Stauffer Chemical Company. Rare earth metal rinse for metal coatings. 3,969,152, Cl. 148-6.15Z.

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Menasha Corporation: *See—*
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Mende, Hanns, to Luwa AG. Method and apparatus for the purification of a liquid contaminated with radioactive substances. 3,969,194, Cl. 203-40.000.

Menegus, Robert L. Rotatable-mounting apparatus for sails. 3,968,765, Cl. 114-102.000.

Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, to Boehringer Ingelheim GmbH. 1-(2'-Alkyl-3',4'-dihydroxy-phenyl)-2-(phenylalkyl-amino)-alkanols-(1) and salts thereof. 3,969,410, Cl. 260-570.600.

Menz, Fred: *See—*
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Mercier, Leo: *See—*
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Merkl, George G. Metalic-organo-peroxide and organo-metalic-peroxide and preparation thereof. 3,969,387, Cl. 260-448.00R.

Merle, Michel, to Andrew Corporation. Method and apparatus for producing continuous lengths of coaxial products. 3,968,918, Cl. 228-148.000.

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Merson, Karol J. Panel for prefabricated metal buildings. 3,968,603, Cl. 52-86.000.

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Metallgesellschaft Aktiengesellschaft: *See—*
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Mettler, Hermann; and Aschwanden, Paul, to Aktiengesellschaft Fr. Mettler's Sohne Maschinenfabrik. Yarn singeing machine having a cleaning device. 3,968,547, Cl. 28-63.000.

Meyer, Engelbert A., to USM Corporation. Trim molding assembly. 3,968,613, Cl. 52-400.000.

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Meyer, Jeffrey G., to Anderson Development Company. Chromium tris-diorgano-orthophosphate-alkyl aluminum halide catalysts for olefin polymerization and alkylation of aromatic compounds. 3,969,272, Cl. 252-431.00P.

Meyer, John R., Jr., to United States of America, Navy. Triple hybrid watercraft. 3,968,762, Cl. 114-66.50H.

Mezrich, Reuben Saul; Etzold, Karl-Friedrich; and Vilkomerson, David Herman Raphael, to RCA Corporation. Visual display of ultrasonic radiation pattern. 3,969,578, Cl. 178-6.800.

Micafil A.G.: *See—*
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Michalczyk, Georg; and Gluzek, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Process for converting γ-butyrolactone into tetrahydrofuran. 3,969,371, Cl. 260-346.10R.

Michel, Edmond, to Solvay & Cie. Continuous rotary apparatus for blow-molding plastic hollow bodies. 3,969,059, Cl. 425-342.000.

Microphor, Inc.: *See—*
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Milkowski, Wolfgang; Zeugner, Horst; von Eickstedt, Klaus-Wolf; and Stuhmer, Werner, to Kali-Chemie Aktiengesellschaft. N-[3-(p-fbenzoyl)-propyl]-N'-[2.(nitro,nitro-el, or methoxyphenyl)-ethyl]-piperazines. 3,969,356, Cl. 260-268.00R.
Miller, Cecil John; and Foster, Richard W. System for recording the actuation of remotely located locking devices. 3,969,584, Cl. 179-2.00A.
Miller, Gaylord R. Dropping disposing. 3,968,937, Cl. 241-5.000.
Miller, John J.: *See—*
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Miller, Karl A.; and Fogelberg, Clement V., to Tusco Engineering Co., Inc. Method for coal firing glass furnaces. 3,969,068, Cl. 432-13.000.
Miller, Karl A.; and Fogelberg, Clement V., to Tusco Engineering Co., Inc. Formulation for producing soda-lime glass including coal ash. 3,969,122, Cl. 106-52.000.
Miller, Larry E., to Ohio Art Company, The. Spring type projectile projecting device. 3,968,784, Cl. 124-27.000.
Mimino, Tohru; Kinoshita, Kazuhisa; Shinoda, Takayuki; and Minegishi, Isao, to Nippon Kokan Kabushiki Kaisha. Cr-Ni system austenitic heat-resisting steel. 3,969,161, Cl. 148-38.000.
Mimken, Frederick J., to General Dynamics Corporation. Digital range computer systems for air navigation systems such as tacan. 3,969,616, Cl. 235-151.320.
Minami, Norio; and Sato, Mitsuya, to Hitachi, Ltd. Transistor circuit. 3,969,637, Cl. 307-237.000.
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Miskech, Peter, to Oxy Metal Industries Corporation. Liquid treating apparatus. 3,969,136, Cl. 134-48.000.
Mitchell, Brian Eric, to Ransomes Sims & Jefferies Limited. Mower machines. 3,968,630, Cl. 56-7.000.
Mitchell, Frank L. Protective workman and equipment covers. 3,968,602, Cl. 52-40.000.
Mitchell, Howard Lee, III; and Hays, James Richard, to Exxon Research and Engineering Company. Iridium-containing catalysts. 3,969,221, Cl. 208-139.000.
Mitchell, William Eric; and Edwards, Reginald Harold, to Dunlop Limited. Vehicle wheels. 3,968,825, Cl. 152-158.000.
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Miyano, Seiji; and Abe, Nobuhiro, to Takeda Chemical Industries, Ltd. 3-Anilino-5,5-disubstituted-2-aminomethyl-2-cyclohexen-1-ones and the salts thereof. 3,969,409, Cl. 260-570.5CA.
Miyashita, Kakunosuke, to Hitachi Metals, Ltd. Adamite roll containing cobalt. 3,968,551, Cl. 29-132.000.
Miyatuka, Hajime, to Rank Xerox Ltd. Photosensitive binder layer for xerography containing titanium oxide and a cadmium pigment. 3,969,113, Cl. 96-1.0LY.
Mizota, Don Minoru: *See—*
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Bell, Weldon K.; and Chang, Clarence D., 3,969,427.
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Modan, Michael M., to General Electric Company. Recovery of resinous compositions consisting of, and including, polyphenylene ethers in particulate form from liquid media. 3,969,320, Cl. 260-47.0ET.
Moelders, Johann, to Berger Maschinenfabriken G.m.b.H. & Co. Horizontal drum-type magnetic separator for granular feeds. 3,969,226, Cl. 209-39.000.
Moller, Jens L., to Continental Can Company, Inc. Method for forming, sealing, capping and pasteurization of beverage in plastic container. 3,969,455, Cl. 264-89.000.
Mollere, John C., to Hercules Incorporated. Seismic marine gun assembly. 3,968,855, Cl. 181-118.000.
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Morgan, Samuel A., to Sycor, Inc. Self centering hub for flexible recording discs and the like. 3,968,972, Cl. 279-2.00R.
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Morozowich, Walter, to Upjohn Company, The. Polycyclic aromatic esters of PGA_1. 3,969,464, Cl. 260-395.000.
Morr, Charles W., to Essex International, Inc. Wedge feeding mechanism for short stroke dynamoelectric machine coil and wedge inserting apparatus. 3,968,556, Cl. 29-205.00D.
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Mortensen, Peder S. Rotary fluid device with pivoted wedge-shaped radial vanes. 3,969,047, Cl. 418-18.000.
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Moses, Dudley K.; and Brodmann, George L., to PPG Industries, Inc. Perphthalic acid after-treatment of phosphonate flameproofed fabrics. 3,969,072, Cl. 8-111.000.
Moss, Gerald; and Craig, John William Thomas, to Exxon Research and Engineering Company. Manufacture of combustible gases. 3,969,089, Cl. 48-197.00R.
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Mostek Corporation: *See—*
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Moyer, Norman E., to Hughes Aircraft Company. Digital watch with oscillator/divider power selection circuitry. 3,968,641, Cl. 58-50.00R.
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Mueller, Theodore R., to United States of America, Energy Research and Development Administration. Automatic electrochemical ambient air monitor for chloride and chlorine. 3,969,209, Cl. 204-195.00R.
Mukaida, Yoshito; Mizuki, Eiichi; Ikeda, Tomoaki; Tsuboi, Masayoshi; Ishizuka, Akio; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Diffusion transfer image receptive materials. 3,969,541, Cl. 427-400.000.
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Murray, John N.; and Hynek, Robert J., to Isotopes, Inc. Process for generating ultra high purity H_2 or O_2. 3,969,481, Cl. 423-219.000.
Murray, Leo Thomas, to Colgate-Palmolive Company. Washing and bleaching composition containing bleach, activator and a nitrilotricarboxylic acid compound. 3,969,257, Cl. 252-102.000.
Murvall, Ake Eugen, to ABU Aktiebolag. Sliding clutch fishing reel. 3,968,943, Cl. 242-212.000.
Mutziger, John Stefan, to Deere & Company. Sound level meter. 3,968,697, Cl. 73-557.000.
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Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Water-soluble coating materials. 3,969,300, Cl. 260-29.4UA.
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Nailor, William Kirby, III; and Thompson, David Clyde, to Du Pont de Nemours, E. I., and Company. Substrate with improved contact terminals. 3,969,010, Cl. 339-17.00C.
Nakamura, Hiroshi: *See*—
Asahara, Masaru; Toyonaga, Noriyasu; Ohyama, Hiroaki; Nakamura, Hiroshi; and Yoshizawa, Ryushiro, 3,969,678.
Nakamura, Hiroyuki; Kawaguchi, Hiroshi; and Hayashi, Hideyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control mechanism for automotive vehicle hydraulic braking system. 3,969,001, Cl. 303-21.00F.
Nakao, Yukimichi: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,969,420.
Nakata, Kunii; and Kubo, Yoshimasa, to Kabushiki Kaisha Akita. Molding apparatus with shielding mold member. 3,968,829, Cl. 164-160.000.
Nally, Phillip L. Symmetrically arranged, hemispherical ball rebounding elements. 3,968,967, Cl. 273-95.00A.
Nanodata Corporation: *See*—
Liebel, John T., Jr., 3,969,704.
Narayanan, Venkatachala L.; Jacobs, Glenn Anthony; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Morpholine containing isothiocyanobenzoxazoles. 3,969,351, Cl. 260-247.10H.
Narayanan, Venkatachala L., to E. R. Squibb & Sons, Inc. Tetrahydrocyclopropa[B]naphthalenes. 3,969,392, Cl. 260-473.00F.
National Distillers and Chemical Corporation: *See*—
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Pugh, Donald W.; and Biggs, James W., 3,969,304.
National Research Development Corporation: *See*—
Gosling, Harold William, 3,969,675.
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NCR Corporation: *See*—
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Neeff, Rutger: *See*—
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Neel, Emmanuel E.; and Joachimsmann, Gerard F., to Shell Oil Company. Catalyst for hydrocarbon conversion. 3,969,277, Cl. 252-455.00Z.
Neffenger, Carel H.: *See*—
Singleton, Albert; and Neffenger, Carel H., 3,969,212.
Negreiros, Salvio Correia Lima. Drawing and writing brush-pen with round and flat hair and adjustable flow of permanent liquid ink. 3,969,028, Cl. 401-279.000.
Neimann, Hans-Joachim; Schuster, Eberhard; and Kersting, Arno, to Kraftwerk Union Aktiengesellschaft. Method for separating gaseous mixtures of isotopes. 3,969,204, Cl. 204-157.10R.
Nelbock-Hochstetter, Michael: *See*—
Jaworek, Dieter; Nelbock-Hochstetter, Michael; Beaucamp, Klaus; Bergmeyer, Hans Ulrich; and Botsch, Karl-Heinz, 3,969,287.
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Nelson, Francis D.; and Presson, Willard M., to Inland Steel Company. Device for preventing ladle nozzle leaks. 3,968,908, Cl. 222-563.000.
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Nelson, Richard Stuart: *See*—
Cairns, James Anthony; Nelson, Richard Stuart; and Pugh, Stanley Frederick, 3,969,082.
Nemit, Jeffrey T., to International Telephone and Telegraph Corporation. Network-fed phased array antenna system with intrinsic RF phase shift capability. 3,969,729, Cl. 343-756.000.
Nemoto, Shogo: *See*—
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Neoloy Products, Inc.: *See*—
Prosen, Emil M., 3,969,303.
Neumann Engraving Co.: *See*—
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Neuzil, Richard W.; and Rosback, Donald H., to Universal Oil Products Company. Process for the separation of cresol isomers. 3,969,422, Cl. 260-621.00B.
Neuzil, Richard W.: *See*—
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Neville, Richard Ernest Gartside, to AMF Incorporated. Continuous measurement of the bulk density of particulate material. 3,968,904, Cl. 222-25.000.
Nevins, Alan J. Endodontic composition and method. 3,968,567, Cl. 32-15.000.
Newall, Christopher Earle: *See*—
Phillipps, Gordon Hanley; and Newall, Christopher Earle, 3,969,345.
Newell, E. Strohm. Assembly for pulling a line. 3,968,952, Cl. 254-134.30R.
Newman, Sydney. Method for producing a zipper closable garment pocket and a pocket provided thereby. 3,968,523, Cl. 2-252.000.
Newmark, Harold Leon: *See*—
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Ikeda, Terukazu; Moritaka, Shintaro; Sugiura, Satohiko; and Umeki, Tsutomu, 3,969,536.
Nicholas, Keith Harlow; and Ford, Ronald Alfred, to U.S. Philips Corporation. Semiconductor devices. 3,969,744, Cl. 357-22.000.

Nichols, Dennis R.: *See—*
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Nichols, Harry S., Jr. Cleaning implement including a sponge, squeegee, scraper and brush. 3,968,535, Cl. 15-105.000.
Nicholson, John S.: *See—*
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Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of copolymers of 4-methylpentene-1. 3,969,333, Cl. 526-154.000.
Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of homopolymers of 4-methylpentene-1. 3,969,335, Cl. 526-154.000.
Nickl, Josef; Teufel, Helmut; Engel, Wolfhard; Seeger, Ernst; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. Antiphlogistic pharmaceutical compositions containing a 1-(nicotinoyl or isonicotinoyl)-3-biphenylyl-alkanone-(2). 3,969,523, Cl. 424-266.000.
Nielsen, Anker J., Jr.; and Morse, Lynn H. Locks for electric meter boxes. 3,968,985, Cl. 292-340.000.
Nielsen, Axel: *See—*
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Nishino, Shiro. Emergency alarm and evacuation system. 3,969,720, Cl. 340-371.000.
Nissan Motor Co., Ltd.: *See—*
Endo, Shiro; Yoshida, Minoru; and Yaotani, Kouichi, 3,968,612.
Sekine, Yoshitada; and Fujikawa, Tsuneo, 3,968,558.
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Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, 3,969,363.
Nix, Maria, nee Saxler, to Nix, Norbert. Dispenser for dispensing metered quantities of liquid from a container. 3,968,907, Cl. 222-416.000.
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NL Industries, Inc.: *See—*
White, Edward Louis; Robertson, William Ernest; and Yu, William Heng-Sen, 3,969,293.
Nobuoka, Soichiro; Asai, Takashi; and Ado, Kazuaki, to Agency of Industrial Science & Technology. Method for improvement of properties of synthetic yellow iron oxide. 3,969,494, Cl. 423-633.000.
Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with automatic exposure-determining structure. 3,969,735, Cl. 354-29.000.
Noda, Fumiyoshi: *See—*
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Noguchi, Masaaki; Sumiyoshi, Masaharu; and Mizusawa, Shinichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning device for internal combustion engine. 3,968,645, Cl. 60-288.000.
Noguchi, Masaaki; and Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torch ignition type internal combustion engine with a restricted orifice. 3,968,782, Cl. 123-191.00S.
Nohda, Masao, to Nippon Kogaku K.K. Curvature measuring optical system in ophthalmometer. 3,969,019, Cl. 351-13.000.
Nohe, Heinz; Jaeger, Peter; and BASF Aktiengesellschaft, to BASF Aktiengesellschaft. Manufacture of propiolic acid. 3,969,200, Cl. 204-79.000.
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Nomiya, Kosei: *See—*
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Nonnenmacher, Gerhard; Bosch, Paul; and Fricke, Hans-Jurgen, to Robert Bosch G.m.b.H. Pressure regulator for an adjustable pump. 3,969,038, Cl. 417-218.000.
Noranda Mines Limited: *See—*
Rosenblum, Frank, 3,968,696.
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Debortoli, George; Chase, Peter McGivery; and Lukas, Helmut H., 3,969,580.
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Norton, Lilburn Lafayette; and Windley, William Thomas, to Du Pont de Nemours, E. I., and Company. Product and process. 3,968,638, Cl. 57-140.00R.
Novello, Frederick C., to Merck & Co., Inc. Inhibiting xanthine oxidase with 3-haloalkyl substituted benzothiadiazine-1,1-dioxides. 3,969,518, Cl. 424-246.000.
Nowak, Walter J., to Veeder Industries, Inc. Pulse generator with asymmetrical multi-pole magnet. 3,969,644, Cl. 310-152.000.
Nurita, Jyoji: *See—*
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O. G. Hoyer A/S: *See—*
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Oakes, Thomas Francis; and Bridgewater, Martin. Method of fabricating hollow, foam-filled, metal structural members. 3,968,561, Cl. 29-460.000.
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Occleshaw, John E.; and Smith, Terence D., to TAC Construction Materials Ltd. Improvements in and relating to board products. 3,969,567, Cl. 428-297.000.
Oettinghaus, Dieter, to Deutsche Edelstahlwerke Aktiengesellschaft. Magnetizing and demagnetizing electrical circuit. 3,969,657, Cl. 317-157.5PM.
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Ogawa, Haruo, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Workpiece lapping device. 3,968,598, Cl. 51-55.000.
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Oguchi, Kikuo; Shimoi, Akio; and Ogata, Toshiaki, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal vibrator. 3,969,641, Cl. 310-9.500.
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Ohyama, Hiroaki: *See—*
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Okey, Bernard J., to BASF Aktiengesellschaft. Synchronizing system for video recorders. 3,969,758, Cl. 358-8.000.
Okumura, Osamu; Sakatani, Takenobu; Ohbu, Kazuo; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Method of manufacturing salt of α-sulfofatty acid ester. 3,969,375, Cl. 260-400.000.
Olesen, Henry Frederik, to Titan Separator A/S. Centrifuge. 3,968,929, Cl. 233-21.000.

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O'Neill, Wilbur J., to Westinghouse Electric Corporation. Underwater breathing apparatus. 3,968,794, Cl. 128-142.300.

O'Neill, Wilbur J.; and Colston, John R., to Westinghouse Electric Corporation. Underwater breathing apparatus. 3,968,795, Cl. 128-142.300.

Onishi, Kazuo: *See—*
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Onozaki, Satoshi; Nemoto, Shogo; and Hazeyama, Takeshi, to Nittetsu Mining Company, Ltd. Process for recovering tungsten from alkaline leaching solution of tungsten ores. 3,969,484, Cl. 423-58.000.

Ontario Paper Company Limited, The: *See—*
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Ormond, Alfred Neuman. Electrical equalization of load element sensitivity. 3,968,683, Cl. 73-141.00A.

Ormond, Alfred Newman. Mechanical equalization of strain gauge sensitivity. 3,968,676, Cl. 73-1.00B.

Osborn, Charles W., to Phillips Petroleum Company. Molding of poly(arylene sulfide) resins. 3,969,307, Cl. 260-37.00R.

Oschatz, Christian; and Somm, Franz, to Sandoz Ltd. Drying process. 3,968,571, Cl. 34-14.000.

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Osieka, Hans; Pommer, Ernst-Heinrich; and Kiefer, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method of controlling fungi. 3,969,510, Cl. 424-324.000.

Osika, Thomas F., to McGill Manufacturing Company, Inc. Key operated electric ground switch. 3,969,597, Cl. 200-44.000.

Osrodek Badawczo-Rozwojewy Przemyslu Budowy Urzadzen Chemicznych "Cebea": *See—*
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Oswald, Alexis A.; and Valint, Paul L., Jr., to Ciba-Geigy AG. O,S-dialkyl-O-cyanomethylphenylthio-phosphates and -dithiophosphates. 3,969,438, Cl. 260-940.000.

Oswald, Alexis A.; and Valint, Paul L., Jr., to Ciba-Geigy AG. O,S-dialkyl-O-allylphenyl-thiophosphates and -dithiophosphates. 3,969,444, Cl. 260-956.000.

Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy AG. Asymmetric O,S-dialkyl dithiophosphoric acid esters of 1,2,3-benzotriazin-4-ones. 3,969,517, Cl. 424-200.000.

Otsuka Pharmaceutical Company Limited: *See—*
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Ott, Jack J., to Dow Chemical Company, The. Treating agent for high melting temperature metals. 3,969,105, Cl. 75-53.000.

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Owens-Corning Fiberglas Corporation: *See—*
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Packer, Gilbert; Boucher, Roger W.; Moore, James M.; Wark, John D.; and Holzwarth, Henry A., to International Paper Company. Disposable douche product. 3,968,797, Cl. 128-232.000.

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Palecek, Jaroslav: *See—*
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Palifka, Robert G., to United States of America, Navy. (Flex'ator) arming spring device. 3,968,751, Cl. 102-76.00R.

Palmer, Richard Claxton; and Clemens, Jon Kaufmann, to RCA Corporation. Color-picture/multichannel-sound record and recording/playback apparatus and methods therefor. 3,969,756, Cl. 358-4.000.

Paluck, Robert John; and Proebsting, Robert James, to Mostek Corporation. Self-biased trinary input circuit for MOSFET integrated circuit. 3,969,633, Cl. 307-205.000.

Papouchado, Lucien Marc, to Du Pont de Nemours, E. I., and Company. Segmented copolyester adhesives stabilized by alkaline earth oxides and carboxylic compounds. 3,969,294, Cl. 260-26.000.

Pappo, Raphael; and Jung, Christopher, to G. D. Searle & Co. Preparation of prostaglandin precursors. 3,969,391, Cl. 260-468.00K.

Papst, Georg: *See—*
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Paris, Bobby J., to Phillips Petroleum Company. Carbon black pelleting. 3,969,457, Cl. 264-117.000.

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Passal, Frank, to M & T Chemicals Inc. Electroplating processes and compositions. 3,969,399, Cl. 260-513.00R.

Pastor, Ricardo C.; and Timper, Arthur J., to Hughes Aircraft Company. Purification of alkali metal chlorides and bromides. 3,969,491, Cl. 423-499.000.

Pavey, Robert L.; and Mone, Patrick E., to Swift & Company. Shelf-stable low-fat biologically fermented dairy product. 3,969,534, Cl. 426-34.000.

Peabody Coal Company: *See—*
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Pearce, Ronald: *See—*
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Pearson, Karl Henry, Jr. Combined spoon and toy. 3,968,591, Cl. 46-1.00R.

Pecorari, Felice. Radial fluid-pressure apparatus. 3,968,736, Cl. 92-165.00R.

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Pelton, Peter G., to Continental Can Company, Inc. Time release aerosol dispenser. 3,968,905, Cl. 222-70.000.

Penneck, Richard John, to Raychem Limited. Polymer compositions. 3,969,308, Cl. 260-37.0SB.

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Pennsylvania Engineering Corporation: *See—*
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Pennwalt Corporation: *See—*
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Perevozkin, Jury Leibovich; Mkrtychian, Anatoly Aramovich; Baryshevsky, Leonid Mikhailovich; Livshits, Vadim Manuilovich; Meilikhov, Daniel Semenovich; Govorov, Jury Ivanovich; Beschastny, Andrei Stepanovich; and Maximov, Fedor Spiridonovich. Method of preparing ceramic casting moulds for pouring metal therein. 3,968,827, Cl. 164-23.000.

Pergler, Charles C., to All-Steel Inc. Safety latch and drawer movement sequencing control arrangement for file cabinets. 3,969,008, Cl. 312-221.000.

Perkins, William V., to Maxon Industries, Inc. Unitized two stage compactor apparatus for refuse collecting trucks or the like. 3,968,891, Cl. 214-83.300.

Perl, Richard L., to Tappan Company, The. Blue flame gas smooth top range. 3,968,785, Cl. 126-39.00J.

Permalite Chemicals Ltd.: *See—*
Law, Malcolm John; and Hutchinson, Peter James, 3,969,198.

Peterson, Carl M.: *See—*
Lonnes, Perry B.; Peterson, Carl M.; Lundgren, Dale A.; and Rees, Laverne W., 3,969,479.

Peterson, Glen, to Fowlkes, Richard E., a part interest. Method for finding temperature environments for fish. 3,968,586, Cl. 43-4.500.

Peterson, Janet B.: *See—*
Dexter, Martin; and Peterson, Janet B., 3,969,383.

Peterson, Richard C. Mini-volleyball court layout. 3,968,968, Cl. 273-95.00H.

Peterson, Roy L., Sr. Fish clamping apparatus. 3,968,588, Cl. 43-53.500.

Petitpierre, Jean Claude: *See—*
Koller, Stefan; and Petitpierre, Jean Claude, 3,969,346.

Petterson, Eric Sigfried: *See—*
Greek, John Charlie, Jr.; Petterson, Eric Sigfried; Tanner, Howard Carl; and Terry, David Wesley, 3,968,868.

Peva, Stanley W., Jr., to Austin-Gordon Design, Inc. Straw dispenser. 3,968,901, Cl. 221-93.000.

Pfeiffer and Langen: *See—*
Schwengers, Dieter; Schneider, Hans Georg; and Keller, Ingrid, 3,969,538.

Pfotenhauer, James M. Crossbow type gun. 3,968,783, Cl. 124-25.000.

Phelps Dodge Industries, Inc.: *See—*
Santos, Adrian Y., Jr.; and Feder, Charles, 3,969,169.

Phillipps, Gordon Hanley; and Newall, Christopher Earle, to Glaxo Laboratories Limited. 20β,21-Epoxy-3α-hydroxy-5α-pregnanes and derivatives thereof. 3,969,345, Cl. 260-239.55R.

Phillips Petroleum Company: *See—*
Osborn, Charles W., 3,969,307.
Paris, Bobby J., 3,969,457.
Schiff, Sidney, 3,969,234.

Phillips, Wendell Gary; and Ratts, Kenneth Wayne, to Monsanto Company. Substituted carbamoyl sulfines and their manufacture. 3,969,407, Cl. 260-561.00S.

Photocircuits Division of Kollmorgan Corporation: *See—*
Zeblisky, Rudolph J., 3,969,554.

Picker Corporation: *See—*
Heisner, Donald N.; and Loyer, Phillip K., 3,969,627.

Pierre, Marcel J., to Societe Materiel pour Toutes Applications Plastiques - M.A.P. Press for moulding gramophone records and the like. 3,969,057, Cl. 425-242.00R.

Pierro, Joseph J.: *See—*
Grundy, Reed H.; and Pierro, Joseph J., 3,969,654.

Pietsch, Hartmut; Clauss, Karl; Schmidt, Erwin; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide. 3,969,348, Cl. 260-243.00R.

Pietsch, Hartmut: *See—*
Schmidt, Erwin; Clauss, Karl; Pietsch, Hartmut; and Jensen, Harald, 3,969,347.

Pilcher, David W. Process for separating water and liquid hydrocarbons from a fluid flow medium. 3,968,659, Cl. 62-5.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Watanabe, Hiroshi; Shimamura, Isao; Murohushi, Norio; Abe, Masao; Ando, Yoshio; and Takahashi, Masaaki, 3,969,211.

Pinkerton, Ken: *See—*
Burford, Milton K.; Mattis, Joseph F.; Gratton, Peter D.; Donahue, William J.; Halling, Michael A.; Pinkerton, Ken; Cammack, Thomas A.; Bernardin, Rodney A.; Johnson, Lee; Lohmann, Art; and Abt, Ed, 3,968,748.

Piper, Frank R., to Penn's Woods Products, Inc. Game caller having diaphragm means, megaphone and bellows. 3,968,592, Cl. 46-178.000.

Pipitone, Roberto; and Montesi, Vittorio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Pushbutton-controlled call-number selector for dial-equipped telephone. 3,969,592, Cl. 179-90.00K.

Piry, Horst: *See—*
Dobler, Helmut; Nadolny, Kurt; Zeilinger, Karl; Lamm, Heinz; and Piry, Horst, 3,969,048.

Plastronics, Inc.: *See—*
Johnston, Ray H.; Mather, Bryon L.; and Clark, James L., 3,968,925.

Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Soldering alloy for connecting parts of which at least some are made of aluminium. 3,969,110, Cl. 75-166.00C.

Plempel, Manfred: *See—*
Draber, Wilfried; Plempel, Manfred; and Buchel, Karl Heinz, 3,969,522.

Pocock, Benjamin K.: *See—*
Emmett, Robert C., Jr.; and Pocock, Benjamin K., 3,969,247.

Poerink, Jannes Jonge. Bedstead having a woven support. 3,968,528, Cl. 5-211.000.

Poignant, Jean-Claude, to Science Union et Cie, Societe Francaise de Recherche Medical. Pharmaceutical compositions containing tetrahydroalstonine and method for treating circulation disorders. 3,969,521, Cl. 424-262.000.

Poklacki, Erwin S., to Borg-Warner Corporation. Method for lowering the minimum pour temperature of fatty acids. 3,969,253, Cl. 252-77.000.

Polacek, Ivo: *See—*
Breuer, Hermann; and Polacek, Ivo, 3,969,365.

Polaroid Corporation: *See—*
Idelson, Elbert M., 3,969,120.
Johnson, Bruce K.; and Whiteside, George D., 3,969,738.
Johnson, Bruce K.; Josephson, Donald G.; and Whiteside, George D., 3,969,739.
Lehmann, Walter G., 3,969,736.

Poliniere, Jean-Paul, to Grossman, Allen, a part interest. Method and means for information presentation. 3,968,573, Cl. 35-7.00R.

Polysar Limited: *See—*
Lasis, Evalds; and Buckler, Ernest Jack, 3,969,330.

Pomeroy, Raymond V.; and Scott, Lewis A., to Omark Industries, Inc. Packaging for power loads and fasteners. 3,968,873, Cl. 206-223.000.

Pommer, Ernst-Heinrich: *See—*
Osieka, Hans; Pommer, Ernst-Heinrich; and Kiefer, Hans, 3,969,510.

Pomogailo, Anatoly Dmitrievich: *See—*
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,969,429.

Pond, David M.: *See—*
Burpitt, Robert D.; Pond, David M.; and Dickerson, Mary E., 3,969,372.

Porta Systems Corporation: *See—*
DeLuca, Paul V.; Gazzo, John J., Jr.; Santulli, Vincent F.; Siegel, Errol; and Mannino, Vito, 3,969,594.

Posner, Richard, to Creative Polymer Products Co. Method of making a heat transferable mold section. 3,969,175, Cl. 156-221.000.

Potgiesser, Jan Antoon Ludolf: *See—*
Gorter, Frederik Willem; and Potgiesser, Jan Antoon Ludolf, 3,969,769.

Potters Industries Inc.: *See—*
Cerbo, Thomas A., 3,969,224.

Poty, Bernard; Leroy, Jacques; and Jachimowicz, Leon, to Agence Nationale de Valorisation de la Recherche (ANVAR). Thermally controlled microscope stage assembly. 3,969,013, Cl. 350-87.000.

Poupitch, Ougljesa Jules, to Illinois Tool Works Inc. Method of packaging using extruded net. 3,968,621, Cl. 53-52.000.

Powell, Harvey E. Bell housing assembly unit. 3,968,987, Cl. 294-78.00R.

Powell, James R.: *See—*
Winsche, Warren E.; Miles, Francis T.; and Powell, James R., 3,969,631.

Powell, Richard James; and Prejean, George Wyatt, to Du Pont de Nemours, E. I., and Company. Process for preparing ionically cross-linked copolymers. 3,969,434, Cl. 260-897.00B.

Power Hybrids, Inc.: *See—*
Martin, John R.; and Garboushian, Vahan, 3,969,752.

PPG Industries, Inc.: *See—*
Jensen, Thomas H., 3,969,098.
Moses, Dudley K.; and Brodmann, George L., 3,969,072.
Reese, Walter J., 3,969,099.
Schimmel, Karl F.; and Wismer, Marco, 3,969,566.

Prats, Danny J., to Xerox Corporation. Method for monitoring copy quality. 3,969,114, Cl. 96-1.400.

Precision Paving Products Corporation: *See—*
Silbernagel, Frederick J., 3,969,035.

Prejean, George Wyatt: *See—*
Powell, Richard James; and Prejean, George Wyatt, 3,969,434.

Presson, Willard M.: *See—*
Nelson, Francis D.; and Presson, Willard M., 3,968,908.

Priest, Roger E.: *See—*
Sasena, Robert C.; and Priest, Roger E., 3,969,090.

Procter, Brian, to Hayssen Manufacturing Co. Apparatus for making plastic containers. 3,969,058, Cl. 425-242.00B.

Produits Chimiques Ugine Kuhlmann: *See—*
Sailer, Andre Louis; and Frank, Pierre, 3,969,339.

Proebsting, Robert James; and Green, Robert Sherman, to Mostek Corporation. Dynamic random access memory misfet integrated circuit. 3,969,706, Cl. 340-173.00R.

Proebsting, Robert James: *See—*
Paluck, Robert John; and Proebsting, Robert James, 3,969,633.

Prosen, Emil M., to Neoloy Products, Inc. Lining material for acrylic dentures and method of preparing the same. 3,969,303, Cl. 260-31.80C.

Pucci, Donald G.: *See—*
Kelly, Peter B.; and Pucci, Donald G., 3,969,174.

Puch, Erwin F., Jr.: *See—*
Puch, Erwin F., Sr.; and Puch, Erwin F., Jr., 3,968,842.

Puch, Erwin F., Sr.; and Puch, Erwin F., Jr. Tomato plant harvesting apparatus. 3,968,842, Cl. 171-11.000.

Puddington, Ira E.: *See—*
Capes, Charles E.; McIlhinney, Allan E.; and Puddington, Ira E., 3,969,103.

Pueschner, Erich: *See—*
Boeckenhoff, Hermann Josef; Thoms, Gunter; and Pueschner, Erich, 3,969,085.

Pugh, Donald W.; and Biggs, James W., to National Distillers and Chemical Corporation. Ethylene polymer films. 3,969,304, Cl. 260-32.6PQ.

Pugh, Stanley Frederick: *See—*
Cairns, James Anthony; Nelson, Richard Stuart; and Pugh, Stanley Frederick, 3,969,082.

Quantel, Limited: *See—*
Coffey, John Albert, 3,969,760.

Quenot, Michel, to Stanley-Mabo. Security key-ring. 3,968,670, Cl. 70-456.00R.

Quist, Frederick Fenn, Jr.: *See—*
Johnson, Oliver Duane; and Quist, Frederick Fenn, Jr., 3,968,959.

R. T. Vanderbilt Company, Inc.: *See—*
Beadle, Howard C., 3,969,315.

Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; Nitz, Rolf-Eberhard; and Schraven, Eckhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Derivatives of 1-phenoxy-3-amino-propan-2-ol and process for their production. 3,969,363, Cl. 260-296.0AE.

Radek, John R., to Ready Metal Manufacturing Co. Handle. 3,969,009, Cl. 312-320.000.

Radici, Pierino: *See—*
Ackermann, Jacob; and Radici, Pierino, 3,969,344.

Radlmann, Eduard; Schaffner, Heinz; Lorenz, Gunter; and Nischk, Gunther, to Bayer Aktiengesellschaft. Substantially non-inflammable acrylonitrile copolymers containing antimony. 3,969,318, Cl. 260-45.75B.

Rajala, Robert L.: *See—*
Granberg, Mauritz L.; Hanson, Howard N.; Rajala, Robert L.; and Whipple, William G., 3,969,639.

Rakhmanov, Viktor Vasilievich: *See—*
Vopilkin, Alexeli Kharitonovich; Ermolov, Igor Nikolaevich; Ryzhov-Nikonov, Vladimir Ivanovich; Ivanov, Valery Ivanovich; Ryk, Vladimir Izidorovich; Rakhmanov, Viktor Vasilievich; Korolev, Vladimir Dmitrievich; and Krasinsky, Petr Yakovlevich, 3,968,680.

Ralbovsky, Frank Stephen, to General Electric Company. Pneumatic thickness sensor head. 3,968,679, Cl. 73-37.700.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. 3,5-Dialkyl-4-hydroxyphenylalkyl substituted piperazine diones and polymeric compositions stabilized thereby. 3,969,316, Cl. 260-45.80N.

Ramirez, Ernest R., to Swift & Company. Waste water treatment. 3,969,203, Cl. 204-149.000.

Ramirez, Ernest R., to Swift & Company. Electrocoagulation system for removing pollutants from wastewater. 3,969,245, Cl. 210-44.000.

Randar, George Andrew; and Young, Harris William, to Gillette Company, The. Writing instrument. 3,969,027, Cl. 401-199.000.

Rank Xerox Ltd.: *See—*
Miyatuka, Hajime, 3,969,113.

Ransomes Sims & Jefferies Limited: *See—*
Mitchell, Brian Eric, 3,968,630.

Raskatov, Viktor Georgievich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Besludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Rasmussen, Emil B. Process for manufacturing fire-retardant cotton felt. 3,968,541, Cl. 19-66.00R.

Rathmell, Richard K. Ski boat with adjustable rigidity. 3,968,578, Cl. 36-121.000.

Ratti, Charles: *See—*
Ratti, Helen; and Ratti, Charles, 3,969,610.

Ratti, Helen; and Ratti, Charles, to Lawrence Piska Associates, Inc., a part interest. Liquid heating device. 3,969,610, Cl. 219-441.000.

Ratts, Kenneth Wayne: *See—*
Phillips, Wendell Gary; and Ratts, Kenneth Wayne, 3,969,407.

Ravesloot, Donald. Apparatus for laying down a tape strip. 3,969,180, Cl. 156-523.000.

Raychem Limited: *See—*
Penneck, Richard John, 3,969,308.

Raydon, Stephen M.; and Hays, Ronald E., to Video and Audio Artistry Corporation. Audio pan generator. 3,969,588, Cl. 179-1.00G.

Raymond Lee Organization, Inc., The: *See—*
Basham, Monte C., 3,968,589.
Carver, Earl Randy, 3,968,718.
D'Aquanni, Cesare A., 3,968,966.
Linha, Jaromir B., 3,968,585.
Sileo, Rocco M., 3,968,963.

Raytheon Company: *See—*
Hansen, Russell W.; and Fassett, Matthew, 3,969,690.

RCA Corporation: *See—*
Amery, John Gordon, 3,969,757.
Amery, John Gordon, 3,969,759.
Drukaroff, Israel; and Morren, Wally, 3,969,751.
Mezrich, Reuben Saul; Etzold, Karl-Friedrich; and Vilkomerson, David Herman Raphael, 3,969,578.
Palmer, Richard Claxton; and Clemens, Jon Kaufmann, 3,969,756.

RCS Color Labs: *See—*
Savia, Salvatore P., 3,969,115.

Reader, Arthur M., to Celanese Corporation. Polyurethanes. 3,969,394, Cl. 260-471.00C.

Reader, Paul D.; and Kaufman, Harold R., to Ion Tech, Inc. Electron-bombardment ion source including segmented anode of electrically conductive, magnetic material. 3,969,646, Cl. 313-359.000.

Ready Metal Manufacturing Co.: *See—*
Radek, John R., 3,969,009.

Recker, Florian B. Torque transmitting coupling. 3,969,033, Cl. 403-322.000.

Recognition Equipment Incorporated: *See—*
McJohnson, Robert B., 3,969,612.

Redd, James B., to A. E. Staley Manufacturing Company. Vacuum dehydration of heat sensitive materials. 3,969,183, Cl. 159-49.000.

Rees, Laverne W.: *See—*
Lonnes, Perry B.; Peterson, Carl M.; Lundgren, Dale A.; and Rees, Laverne W., 3,969,479.

Reese, Johannes: *See—*
Kraft, Kurt; Reese, Johannes; and Walz, Gerd, 3,969,290.

Reese, Walter J., to PPG Industries, Inc. Bushing environmental control system. 3,969,099, Cl. 65-2.000.

Regenass, Willy, to Ciba-Geigy Corporation. Apparatus for controlling the temperature of a heat exchange liquid. 3,968,832, Cl. 165-58.000.

Reich, Rudolf. Automatic yarn changer. 3,968,759, Cl. 112-83.000.

Reid, F. Joseph: *See—*
Kim, Han J.; and Reid, F. Joseph, 3,969,112.

Reifenscheid, Bernhard: *See—*
Deutsch, Ernst; and Reifenscheid, Bernhard, 3,968,609.

Reilly, Eugene P.: *See—*
Borman, Willem F. H.; and Reilly, Eugene P., 3,969,306.

Reilly, Mason J., to Boeing Company, The. Energy attenuator. 3,968,863, Cl. 188-1.00C.

Reinsch, Herbert; and Korner, Peter, to Robert Bosch G.m.b.H. Objective system with zoom lens for photographic apparatus. 3,969,018, Cl. 350-187.000.

Reliance Electric Company: *See—*
Woyton, Joseph T., 3,969,677.

Research Corporation: *See—*
Kupchan, S. Morris; and Britton, Ronald W., 3,969,369.

Restaurant Technology, Inc.: *See—*
Jewell, Donald K., 3,968,921.

Reusser, Fritz: *See—*
Argoudelis, Alexander D.; and Reusser, Fritz, 3,969,515.

Reynolds, Richard L., to Litton Fastening Systems. Fastener manufacturing apparatus. 3,968,533, Cl. 10-2.000.

Rhone-Poulenc Industries: *See—*
Bouchaudon, Jean, 3,969,342.

Rhone-Progil: *See—*
Daumas, Jean-Claude; and Le Page, Madeleine, 3,969,424.
Meiller, Francois, 3,969,261.

Richard, Georges: *See—*
Legg nee Jouve, Monique; and Richard, Georges, 3,968,815.

Richard, Paul Herbert, to Du Pont de Nemours, E. I., and Company. Cyclone separator having multiple-vaned gas inlets. 3,969,096, Cl. 55-455.000.

Richard, William R., Jr.: *See—*
Herber, John F.; Street, Robert W.; and Richard, William R., Jr., 3,969,254.

Richardson Company, The: *See—*
Muzyczko, Thaddeus M.; and Jones, Thomas H., 3,969,119.

Richter, Herbert P.; Heller, Carl A.; and Tedrick, Ruth E., to United States of America, Navy. Method of producing light using catalyst chemiluminescent system. 3,969,263, Cl. 252-186.000.

Riess, Karl. Golf ball pocket and improved golf garment. 3,968,522, Cl. 2-250.000.

Rigler, Gunter: *See—*
Weinzinger, Hans; Hopf, Bruno; and Rigler, Gunter, 3,969,668.

Rikagaku Kenkyusho: *See—*
Fukada, Eiichi; Takamatsu, Toshiaki; and Yasuda, Iwao, 3,968,790.

Riker Laboratories, Inc.: *See—*
Gerster, John F., 3,969,463.
Hammar, Walton James, 3,969,467.
Hammar, Walton James; and Conway, Alvin C., 3,969,505.

Ripka, Josef: *See—*
Junek, Jan; Vobornik, Vaclav; Jaros, Frantisek; Ripka, Josef; Lihtarova, Ludmila; Ohlidal, Vladimir; and Hortlik, Frantisek, 3,968,636.

Ritcey, Gordon M.: *See—*
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Rite Autotronics Corporation: *See—*
Schwartz, Edwin L., 3,968,539.

Roane, Asa E., to United States of America, Army. Length sensing single strand shuttle cutter apparatus for cutting propellant grain. 3,969,054, Cl. 425-142.000.

Robert Bosch G.m.b.H.: *See—*
Fussner, Paul; and Salmanzig, Horst, 3,969,044.
Nonnenmacher, Gerhard; Bosch, Paul; and Fricke, Hans-Jurgen, 3,969,038.
Reinsch, Herbert; and Korner, Peter, 3,969,018.

Roberts, Alan, to British Broadcasting Corporation. Generation of dot matrix characters on a television display. 3,969,716, Cl. 340-324.0AD.

Roberts, Charles B., to Dow Chemical Company, The. Aluminum plating corrosion resistance. 3,969,555, Cl. 427-383.000.

Roberts, Edward David; and Steggerda, Jan Frederik, to U.S. Philips Corporation. Method of providing a patterned layer of silicon-containing oxide on a substrate. 3,969,543, Cl. 427-54.000.

Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., to United States of America, Army. Intense, energetic electron beam assisted X-ray generator. 3,969,628, Cl. 250-402.000.

Robertshaw Controls Company: *See—*
Mitts, Richard K.; Jackson, Wilbur F.; and Willson, James R., 3,969,656.

Robertson, James E.: *See—*
Gorges, Franz A.; and Robertson, James E., 3,968,862.

Robertson Paper Box Co., Inc.: *See—*
Tyrseck, Walter J., 3,968,924.

Robertson, William Ernest: *See—*
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Robinson, Dan L.: *See—*
Worlton, Dan L., deceased; and Robinson, Dan L., 3,969,187.

Robinson, Peter Anthony: *See—*
Ballard, Denis George Harold; Parkins, Adrian Walter; Robinson, Peter Anthony; Ibekwe, Samuel Dimewere; Lappert, Michael Franz; and Pearce, Ronald, 3,969,386.
Robitaille, Dennis R.; Vukasovich, Mark S.; and Barry, Henry F., to Sherwin-Williams Company, The. Molybdate corrosion inhibiting pigment and method for preparing same. 3,969,127, Cl. 106-292.000.
Robson, Robert, to John Ratcliff (Tail Lifts) Limited. Vehicle load lifting and lowering units. 3,968,890, Cl. 214-75.00T.
Rocklin, Isadore J. Electronic spark treating and eroding metals. 3,969,601, Cl. 219-69.00G.
Rockwell International Corporation: *See—*
Jain, Anant K.; and Marston, Robert K., 3,969,590.
Jovick, Raymond John, 3,969,002.
Lai, San-Cheng, 3,969,139.
Thorsen, Arthur C., Jr.; and Hughes, Arlen J., 3,969,753.
Rodgers, Robert E., to Stant Manufacturing Company, Inc. Pressure-vacuum relief valve assembly. 3,968,897, Cl. 220-204.000.
Roffelsen, Franciscus, to Naamloze Venootschap Spiro Research N.V. Heat exchanger. 3,968,554, Cl. 29-157.3AH.
Rohm and Haas Company: *See—*
Lewis, Sheldon N.; and Miller, John J., 3,969,560.
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Roman, Steven A.: *See—*
Tieman, Charles H.; Kollmeyer, Willy D.; and Roman, Steven A., 3,969,354.
Romanenko, Oleg Nikolaevich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloshudtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.
Romano, Frank A., Jr., to General Electric Company. Projector tilt mechanism. 3,968,949, Cl. 248-11.000.
Romeiser, Bernhard: *See—*
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, 3,968,835.
Roner, Werner: *See—*
Blattler, Ernst; and Roner, Werner, 3,968,692.
Roos, Jan, to U.S. Philips Corporation. Device for the thermomagnetic recording of information. 3,969,765, Cl. 360-59.000.
Rosback, Donald H.; and Neuzil, Richard W., to Universal Oil Products Company. Olefin separation process. 3,969,223, Cl. 208-310.00Z.
Rosback, Donald H., to UOP Inc. Method of manufacturing a zeolitic adsorbent. 3,969,276, Cl. 252-455.00Z.
Rosback, Donald H.: *See—*
Neuzil, Richard W.; and Rosback, Donald H., 3,969,422.
Rosenbaum, Barry M.: *See—*
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Rosenbaum, Walter Steven: *See—*
Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; Kocher, Donald Francis; and Rosenbaum, Walter Steven, 3,969,698.
Bollinger, Ellen Willis; Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,969,700.
Rosenblum, Frank, to Noranda Mines Limited. Device for taking samples of slurries or of any suspension of particulate material in liquid and for measuring desired chemical or physical properties of such samples. 3,968,696, Cl. 73-425.40R.
Rosenkranz, Otto; Seifert, Karl-Heinrich; and Horwege, Claus, to Heidenreich & Harbeck Zweingniederlassung der Gildemeister AG. Apparatus for deforming a tubular slug of thermoplastic material. 3,969,060, Cl. 425-387.00B.
Rosentreter, William O.; Justice, Richard M.; and Wade, Timothy E., to Otto H. Rosentreter Co. Dust wetting apparatus. 3,968,903, Cl. 222-1.000.
Roskott, Lodewijk; and Groenendaal, Arnoldus Adrianus Maria, to Akzona Incorporated. Process for stabilization of ultraviolet light curable unsaturated polyester resin mixture. 3,969,206, Cl. 204-159.150.
Ross, Edward A.: *See—*
Banyas, John D.; and Ross, Edward A., 3,968,870.
Ross, Wilfred T.; and Williamson, Harold E., to General Electric Company. Getter for nuclear fuel elements. 3,969,185, Cl. 176-68.000.
Rossfelder, Andre M. Apparatus for sediment dredging and ocean mineral gathering. 3,968,579, Cl. 37-69.000.
Rossum, David Philip, to Oberheim Electronics Inc. Circuit for dynamic control of phase shift. 3,969,682, Cl. 330-85.000.
Rostek, Paul M., to NCR Corporation. Electromagnetic interference shielding gasket for light-weight equipment enclosures. 3,969,572, Cl. 174-35.0MS.
Roura, Miguel Jacinto: *See—*
Bailey, Charles Eugene; and Roura, Miguel Jacinto, 3,969,435.
Rovac Corporation, The: *See—*
Edwards, Thomas C., 3,968,649.
Rovin, Herman; Kreidel, Rudolf; and Levine, Lawrence J., to Automatech Industries Inc. Method and apparatus for the production and handling of articles, particularly of tubular form. 3,968,760, Cl. 112-219.00R.
Rowas, Clifford A., to Schauer Manufacturing Corporation. Automatic control circuit for battery charging systems. 3,969,665, Cl. 320-35.000.
Rowland, Trevor C.: *See—*
Thompson, John R.; and Rowland, Trevor C., 3,969,186.
Royer, Robert E.: *See—*
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RPR, Inc.: *See—*
Davis, Frederick, 3,969,264.
Rubin, Isaac D.; Love, Richard F.; and Holder, Charles B., to Texaco Inc. Novel process and product. 3,969,322, Cl. 260-63.00N.
Rudolph, Frank W.: *See—*
Greatbatch, Wilson; Mead, Ralph T.; Rudolph, Frank W.; and Frenz, Norbert W., 3,969,142.
Mead, Ralph T.; Frenz, Norbert W.; and Rudolph, Frank W., 3,969,143.
Ruhl, Walter Franklin; Nelson, Albert W.; Lucy, Jesse J.; and Marshall, Gerald N., to Lambert Corporation. System for handling debris. 3,968,938, Cl. 241-101.100.
Rumyantsev, Viktor Konstantinovich: *See—*
Zelikman, Abram Naumovich; Voldman, Grigory Markovich; Rumyantsev, Viktor Konstantinovich; Ziberov, Georgy Nikolaevich; and Kagermanian, Valery Sergeevich, 3,969,478.
Rund, Larry D., to Rund Rotary Engines, Inc. Rotary crankless machine. 3,968,776, Cl. 123-43.00C.
Rund Rotary Engines, Inc.: *See—*
Rund, Larry D., 3,968,776.
Rupperi, Arnold, to Allen-Bradley Company. Regenerative motor control with improved circuit means. 3,969,660, Cl. 318-338.000.
Russiyan, Ljudmila Nikolaevna: *See—*
Belov, Gennady Petrovich; Dzhabiev, Taimuraz Savelievich; Dyachkovsky, Fridrikh Stepanovich; Smirnov, Vyacheslav Ivanovich; Karpova, Nelli Dzhavkharovna; Brikenshtein, Khaim-Mordkhe Aronovich; Gerasina, Matrena Petrovna; Kuzmin, Vladimir Evgenievich; Matkovsky, Petr Evgenievich; Russiyan, Ljudmila Nikolaevna; Pomogailo, Anatoly Dmitrievich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,969,429.
Rutz, Peter, to Sulzer Brothers Limited. Hydrostatic piston machine. 3,968,734, Cl. 91-491.000.
Ruud, Gunnar. Frusto-pyramidal box with hinged lid. 3,968,922, Cl. 229-33.000.
Ryan, Kenneth C.: *See—*
Lloyd, Raymond A.; Ryan, Kenneth C.; and Hrybyk, William L., deceased, 3,969,577.
Ryan, William H.; and Evers, Norman H., to Ryan, William H. Method and apparatus for producing steel box toes to be used in safety shoes. 3,968,673, Cl. 72-331.000.
Rydh, Thore Oskar Verner: *See—*
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 3,969,395.
Ryding, Thomas C.: *See—*
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Sadashige Fancy Plywood Industries Co., Ltd.: *See—*
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Sadashige, Takeshi, to Dantani Plywood Co., Ltd.; and Sadashige Fancy Plywood Industries Co., Ltd. Veneer sheet of a plurality of thin flat sections of wood. 3,969,558, Cl. 428-58.000.
Saeman, Walter C., to Olin Corporation. Process for preparing granular calcium hypochlorite in a fluidized bed. 3,969,546, Cl. 427-213.000.
Safranski, Richard W.: *See—*
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SAFT-Societe des Accumulateurs Fixes et de Traction: *See—*
Croissant, Pierre; and Coudrin, Rolande, 3,969,147.
Sailer, Andre Louis; and Frank, Pierre, to Produits Chimiques Ugine Kuhlmann. Water-soluble pentakis-azo dyestuffs derived from 4,4'-diaminoazobenzene. 3,969,339, Cl. 260-159.000.
Saint-Remy Pellissier, Charles Marc Marie, to Societe Anonyme Fondasol-Technique. Penetrometers. 3,968,682, Cl. 73-84.000.
Saito, Akira: *See—*
Tanaka, Katsuo; and Saito, Akira, 3,969,766.

Saito, Tadaomi; Matsuzawa, Yoshimasa; Ninagawa, Sadayoshi; Honna, Masao; Takesada, Masahiko; and Takehara, Masahiro, to Ajinomoto Co., Ltd. Gels of nonpolar liquids with N-acyl amino acids and derivatives thereof as gelling agents. 3,969,087, Cl. 44-7.00C.

Saito, Tadashi: *See—*
Sakai, Toshimitsu; Saito, Tadashi; and Suzuki, Isamu, 3,969,045.

Sakai, Hidemaru; and Baba, Shigeji. Lithographic developing process utilizing a silver halide photographic material containing hydroimidazo-s-triazine and polyalkylene oxide derivative. 3,969,117, Cl. 96-66.00R.

Sakai, Shiro: *See—*
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Sakai, Toshimitsu; Saito, Tadashi; and Suzuki, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Diaphragm vacuum pump for vehicles. 3,969,045, Cl. 417-471.000.

Sakamura Machine Co., Ltd.: *See—*
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Sakanaka, Yasuhiro: *See—*
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Sakatani, Takenobu: *See—*
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Sakuma, Junichi; and Takahashi, Shigeo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for preventing scale in saline water desalting apparatus and saline water reclamation apparatus for carrying out said method. 3,969,193, Cl. 203-7.000.

Salimbeni, Aldo: *See—*
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Salmanzig, Horst: *See—*
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Saltzman, Robert S., to Du Pont de Nemours, E. I., and Company. Method and apparatus for detecting total reduced sulfur. 3,969,626, Cl. 250-344.000.

Saltzman, William H., to Intellectual Property Development Corporation. Compositions and methods useful in rendering lithogenic mammalian bile non-lithogenic. 3,969,503, Cl. 424-240.000.

Salyer, Ival O.: *See—*
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Samuelson, Carl E.: *See—*
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Sanborn, Alfred Watson: *See—*
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Sanderson, Albert E., to Inventronics, Inc. Method for tuning musical instruments. 3,968,719, Cl. 84-454.000.

Sandoz, Inc.: *See—*
Galantay, Eugene E., 3,969,415.
Hardtmann, Goetz E., 3,969,506.
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Santora, Norman J.: *See—*
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Santos, Adrian Y., Jr.; and Feder, Charles, to Phelps Dodge Industries, Inc. Method of making paper-insulated electrical conductor. 3,969,169, Cl. 156-56.000.

Santulli, Vincent F.: *See—*
DeLuca, Paul V.; Gazzo, John J., Jr.; Santulli, Vincent F.; Siegel, Errol; and Mannino, Vito, 3,969,594.

Saoka, Akihiro: *See—*
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Sapper, Jorg, to BBC Brown Boveri & Company Limited. Gas-cooled dynamo-electric machine. 3,969,643, Cl. 310-53.000.

Sargent & Greenleaf, Inc.: *See—*
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Sargent Industries, Inc.: *See—*
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Sasaki, Kazuhiro: *See—*
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Sasaki, Takeshi: *See—*
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Sasena, Robert C.; and Priest, Roger E., to Anderson Corporation. Industrial brush. 3,969,090, Cl. 51-400.000.

Sato, Hironari: *See—*
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Sato, Katsuaki: *See—*
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Sato, Naoki: *See—*
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Saul, David L., to United States of America, Navy. Millimeter waveguide to microstrip transition. 3,969,691, Cl. 333-21.00R.

Saunders, Harry L.: *See—*
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Savenkova, Zinaida Alexandrovna; Logvinenko, Dmitry Danilovich; Tsantker, Karl Lazarevich; Shelyakov, Oleg Porfirievich; Manzhely, Alexandra Pavlovna; Bobrov, Gennady Grigorievich; Ioffe, Genrikh Samuilovich; Mironov, Boris Vasilievich; Kestelman, Pavel Iosifovich; and Egorycheva, Galina Vasilievna. Method of producing inorganic pigments. 3,969,129, Cl. 106-309.000.

Savia, Salvatore P., to RCS Color Labs. Graphics process using a composite of color separated negatives. 3,969,115, Cl. 96-14.000.

Savitz, Donald Alfred: *See—*
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Sayce, John G.; and Brown, David J., to S. C. Johnson & Son, Inc. Solid air freshener gels. 3,969,280, Cl. 252-522.000.

Sayles, David C., to United States of America, Army. Anti-erosive, solid rocket propellant compositions. 3,969,166, Cl. 149-19.400.

Scala, Luciano C.: *See—*
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Schaeffler, Georg, to Industriewerk Schaeffler OHG. Shaft coupling. 3,969,029, Cl. 403-26.000.

Schaerlaekens, Paul: *See—*
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Schaffner, Heinz: *See—*
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Scharf, Daniel J., to Hooker Chemicals & Plastics Corporation. Brominated carbamoyl derivatives useful to impart flame retarding property to combustible substrates. 3,969,230, Cl. 252-8.100.

Schauer Manufacturing Corporation: *See—*
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Scheding, William Lawrence: *See—*
Strubel, John Michael; Mizota, Don Minoru; Tung, Michael; Sanborn, Alfred Watson; McNair, Richard Dale; Forte, Jefferson Frank; and Scheding, William Lawrence, 3,969,618.

Scheer, Marcel: *See—*
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Schering Aktiengesellschaft: *See—*
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Scherrer, John J., to B & L Metal Products (Elmira) Limited. Refuse packer. 3,968,743, Cl. 100-52.000.

Schick, Hans: *See—*
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Nickl, Johann; Schick, Hans; and Mueller-Tamm, Heinz, 3,969,335.

Schiesterl, Gerhard, to Daimler-Benz Aktiengesellschaft. Safety steering for motor vehicle. 3,968,979, Cl. 280-731.000.

Schiff, Sidney, to Phillips Petroleum Company. Lubricant and motor fuel additives. 3,969,234, Cl. 252-33.000.

Schilken, Herbert: *See—*
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Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Articles of manufacturing prepared from polymers of hydrazine or dihydrazides and tricarboxylic acid anhydrides. 3,969,566, Cl. 428-290.000.

Schippers, Ronald. Enclosure structure. 3,968,989, Cl. 296-29.000.

Schlegel Engineering GmbH: *See—*
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Schlegel, William R.; and Hennessey, John J., to All American Industries, Inc. Launching apparatus for flying device. 3,968,947, Cl. 244-63.000.

Schleicher, Ernst E. Tape dispenser. 3,968,915, Cl. 225-65.000.

Schliemann, Gerd, to Computervision Corporation, The. Air bearing piston assembly for semiconductor mask-to-wafer aligner. 3,969,004, Cl. 308-9.000.

Schmidt, Erwin; Clauss, Karl; Pietsch, Hartmut; and Jensen, Harald, to Hoechst Aktiengesellschaft. Process for the manufacture of the potassium salt of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one-2,2-dioxide. 3,969,347, Cl. 260-243.00R.

Schmidt, Erwin: *See—*
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Schmidt, Heinz: *See—*
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Schmidt, Willard C. Kite accessory toy. 3,968,948, Cl. 244-155.00R.

Schneider, Hans Georg: *See—*
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Schneider, Joachim, to Bayer Aktiengesellschaft. Process for N-alkylating aromatic amines. 3,969,411, Cl. 260-577.000.

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Scholz, Hartmut. Arrangement for the tufting of carpets. 3,968,758, Cl. 112-80.000.

Schrading, Mark S., to Kimberly-Clark Corporation. Prefolded disposable diaper. 3,968,799, Cl. 128-287.000.

Schrage, Franklin E.: *See—*
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Schromm, Kurt: *See—*
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Schrot, Joseph R., to Biospherics Incorporated. Use of radioisotopes for rapid identification of microorganisms. 3,969,496, Cl. 424-1.000.

Schubert, Rudolf, to Licentia Patent-Verwaltungs-G.m.b.H. Method of forming a deflection yoke system. 3,968,566, Cl. 29-605.000.

Schuelke, Larry Ray: *See—*
Simon, Jerry Lee; and Schuelke, Larry Ray, 3,968,801.

Schumann, Reinhard: *See—*
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Schupp, Lewis J., to General Electric Company. Photoflash lamp. 3,969,067, Cl. 431-95.00R.

Schuster, Eberhard: *See—*
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Schwan, Thomas J., to Morton-Norwich Products, Inc. 5-Aminoethyl-2,4-diphenylpyrimidine dihydrobromide. 3,969,355, Cl. 260-256.40R.

Schwartz, Allan E.: *See—*
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Schwartz, Edwin L., to Rite Autotronics Corporation. Adjustable handle for an instrument casing. 3,968,539, Cl. 16-115.000.

Schwartz, Joseph: *See—*
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Schwarz, Walter: *See—*
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Schwarze, Werner; and Wolff, Siegfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Triazinesulfenimides of dicarboxylic acids. 3,969,353, Cl. 260-249.500.

Schwengers, Dieter; Schneider, Hans Georg; and Keller, Ingrid, to Pfeiffer and Langen. Recovery of enzymes with ion exchangers. 3,969,538, Cl. 426-491.000.

Scialpi, Leonard Joseph: *See—*
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Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Beam collimation using multiple coupled elements. 3,969,686, Cl. 331-94.50H.

SCM Corporation: *See—*
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Scott, Charles D., to United States of America, Energy Research and Development Administration. Elution electrophoresis. 3,969,218, Cl. 204-299.00R.

Scott, Lewis A.: *See—*
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Scott Paper Company: *See—*
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Seabold, Thomas W., to Minnesota Mining and Manufacturing Company. Transfer adhesive dispensing device. 3,969,181, Cl. 156-577.000.

Seaborn, Paul E.; and Wyant, John R., to Mead Corporation, The. One-piece combination clip. 3,968,546, Cl. 24-67.900.

Seaton-Wilson, Incorporated: *See—*
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Seeger, Ernst: *See—*
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Seifert, Karl-Heinrich: *See—*
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Seilenbinder, Richard W.: *See—*
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Seitetsu Kagaku Co., Ltd.: *See—*
Kawamura, Masao; Nishi, Tadaaki; and Takagi, Syuzi, 3,969,205.

Sekiguchi, Kouichi, to Iwasaki Tsushinki Kabushiki Kaisha. Circuit for preventing impulse generation by operating a hook switch in a telephone set. 3,969,591, Cl. 179-84.00R.

Sekine, Yoshitada; and Fujikawa, Tsuneo, to Nissan Motor Co., Ltd. Apparatus for and method of automatically assembling an automobile body structure. 3,968,558, Cl. 29-429.000.

Sennheiser Electronic: *See—*
Griese, Hans-Joachim; Warning, Paul-Friedrich; and Wichmann, Klaus-Hinrich, 3,969,583.

Seragnoli, Enzo, to G. D. Societa per Azioni. Twist finger device for a candy wrapping machine. 3,968,627, Cl. 53-370.000.

Seragnoli, Enzo, to G. D. Societa per Azioni. Twist finger apparatus for wrapping candies and the like. 3,968,628, Cl. 53-370.000.

Sergeev, Jury Alexandrovich: *See—*
Barannik, Ivan Andreevich; Belkin, Gennady Ivanovich; Borodin, Viktor Ivanovich; Voronova, Natalya Alexandrovna; Romanenko, Oleg Nikolaevich; Bogdanov, Alexandr Petrovich; Beloludtsev, Valery Sergeevich; Marfin, Vladimir Dmitrievich; Shish, Nikolai Yakovlevich; Shevchenko, Anatoly Filippovich; Emelyanov, Ivan Yakovlevich; Boiko, Jury Nikolaevich; Kljuchnik, Mikhail Nikolaevich; Khaber, Nikolai Vasilievich; Raskatov, Viktor Georgievich; Trukhin, Alexandr Fedorovich; Kondratenko, Anatoly Borisovich; Yazev, Vladimir Dmitrievich; Alontsev, Viktor Stepanovich; Startsev, Valery Alexeevich; and Sergeev, Jury Alexandrovich, 3,969,104.

Settineri, William J.: *See—*
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Sexton, Charles W., to General Electric Company. Automatic crossover distortion correction circuit. 3,969,679, Cl. 330-22.000.

Sextro, Gunter: *See—*
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Sharp, Thomas L. Water-soluble imidazoline composition for removing iron sulfide and sludge from metal surfaces. 3,969,281, Cl. 252-542.000.

Shatalov, Lev Nikolaevich: *See—*
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Shatas, Romas A.: *See—*
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Shaw, Alan C., to Ontario Paper Company Limited, The. Process for the manufacture of sodium carbonate. 3,969,488, Cl. 423-421.000.

Shaw, Peter Sylvester. Preparation of ketals. 3,969,416, Cl. 260-615.00A.

Sheckells, Amuel E., to International Steel Company. Operating and speed control mechanism for revolving doors. 3,968,595, Cl. 49-43.000.

Shell Oil Company: *See—*
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Sherwin-Williams Company, The: *See—*
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Simon, Jerry Lee; and Schuelke, Larry Ray. Calf puller. 3,968,801, Cl. 128-352.000.
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Singleton, Albert; and Neffenger, Carel H., to Albert Singleton Corporation, The. Reinforced hanger bracket for electroplating barrel and method of reinforcing a plastic bar. 3,969,212, Cl. 204-213.000.
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Smialek, Robert L., to General Electric Company. Switching devices for photoflash unit. 3,969,065, Cl. 431-95.00A.
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Smith, David A. Charging current voltmeter. 3,969,671, Cl. 324-119.000.
Smith, Donald A., to Combustion Engineering, Inc. Pressure jet atomizer. 3,968,931, Cl. 239-125.000.
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Sobeck, Thomas J., Jr. Hair treatment apparatus. 3,968,805, Cl. 132-9.000.
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Sofianek, Joseph C.; and Kurtz, Donald R., to General Electric Company. Vacuum-type circuit interrupter with a plurality of sets of contacts in parallel. 3,969,598, Cl. 200-144.00B.
Sohre, John S. Contoured supersonic nozzle. 3,968,935, Cl. 239-289.000.
Solt, Dean L. Remotely controlled steering transom for outboard motors. 3,968,768, Cl. 115-18.00R.
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Stalker, Neil J., to F. Jos. Lamb Company. Pallet locating and clamping arrangement. 3,968,869, Cl. 198-19.000.
Stambuk, Berigoj K. Timed medicant dispensing device. 3,968,900, Cl. 221-3.000.
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Struck, Carl-Heinz, to Dr. C. Otto & Comp. G.m.b.H. Process and apparatus for quenching hot coke. 3,969,192, Cl. 202-230.000.
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Su, Stephen C.; and Finnila, Ronald M., to Hughes Aircraft Company. Bucket background subtraction circuit for charge-coupled devices. 3,969,634, Cl. 307-221.00D.
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Sugiura, Junsuke; Takahashi, Junetsu; Shibasaki, Takeyoshi; and Yoneda, Motoaki, to Mitsubishi Kinzoku Kogyo Kabushiki Kaisha. Lancing apparatus with means for ready replacement or renewal of lances for top blown metallurgical furnaces. 3,968,956, Cl. 266-226.000.

Sugiura, Satohiko: *See—*
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Sung, Rodney L.; Chafetz, Harry; Zoleski, Benjamin H.; and Foucher, Walter D., Jr., to Texaco Inc. Sulfurized calcium alkylphenolate compositions. 3,969,235, Cl. 252-42.700.

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Suzuki, Nobuo; and Ketori, Takao, to Hitachi, Ltd. Magnetic head with shield plates for respective head elements. 3,969,771, Cl. 360-121.000.

Suzuki, Takashi, to Matsushita Electric Industrial Co., Ltd. Porous polymer film. 3,969,562, Cl. 428-155.000.

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Swanson, Kenneth B.; and Jensen, Kenneth D., to Midland-Ross Corporation. Hydraulic booster brake pressure regulator. 3,968,814, Cl. 137-505.180.

Sweeney, Doris; and Lee, Mary Ellen. Whipped wax base display. 3,969,556, Cl. 428-13.000.

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Tachikawa, Sakuji. Method of manufacturing a valve. 3,968,553, Cl. 29-157.10R.

Tagansky, Elazar. Cock. 3,968,816, Cl. 137-606.000.

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Tamborini, Ariberto; and Tamborini, Giancarlo. Process of the making of extruded thermoplastic bodies and device for the carrying out of the said process. 3,969,052, Cl. 425-113.000.

Tamborini, Giancarlo: *See—*
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Tan, Sing Liong, to U.S. Philips Corporation. Color television camera provided with a pick-up device and a color filter placed in front thereof. 3,969,763, Cl. 358-42.000.

Tanaka, Hideki; Ishida, Kazutaka; Handa, Minoru; and Kitabatake, Asao, to Furuno Electric Company, Limited. Position detecting device for omega receiving system. 3,969,727, Cl. 343-105.00R.

Tanaka, Hideshi, to Victor Company of Japan, Limited. Color television camera. 3,969,764, Cl. 358-47.000.

Tanaka, Katsuo; and Saito, Akira, to Sony Corporation. Tension control device for a video tape recording and/or reproducing apparatus. 3,969,766, Cl. 360-85.000.

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Tegge, Bruce R.; and Rosenbaum, Barry M., to Exxon Research and Engineering Company. Process for desiccant drier regeneration. 3,969,091, Cl. 55-33.000.

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Tessera, Giancarlo, to Honeywell Information Systems, Inc. Electronic computer with independent functional networks for simultaneously carrying out different operations on the same data. 3,969,702, Cl. 340-172.500.

Tessler, Martin M.; and Jarowenko, Wadym, to National Starch and Chemical Corporation. Retort starches prepared from blends of starch and high amylose starch components. 3,969,340, Cl. 260-233.30R.

Tessler, Martin M., to National Starch and Chemical Corporation. Method for the preparation of starch products and the compounds utilized therefor and the product thereof. 3,969,341, Cl. 260-233.500.

Teufel, Helmut; Engel, Wolfhard; and Seeger, Ernst, to Boehringer Ingelheim GmbH. (4-Biphenylyl)-butenols. 3,969,418, Cl. 260-618.00R.

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Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Mobile track working machine. 3,968,752, Cl. 104-7.00B.

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Timmerman, Daniel Maurice; and De Winter, Walter Frans, to AGFA-GEVAERT N.V. Recording material. 3,969,283, Cl. 260-2.0EN.

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Tsuneda, Terukuni, to Canon Kabushiki Kaisha. Liquid developer for electrophotography and process for developing latent images. 3,969,238, Cl. 252-62.10L.

Tsunoda, Fukuyuki. Steam presser. 3,968,581, Cl. 38-15.000.

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Tsuyuki, Tadaharu; Yagi, Hajime; and Kobayashi, Toshiro, to Sony Corporation. Complementary bipolar transistors with IIL type common base drivers. 3,969,747, Cl. 357-44.000.

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Weber, Heinz P.; and Langlois, Gordon E., to Chevron Research Company. Method for impregnating a water-sensitive solid with a water-soluble material using an aqueous impregnating solution. 3,969,275, Cl. 252-455.00R.

Weed, Terrance O.; and Mougel, Daniel. Protective cover for automobile mounted bicycle carrier. 3,968,913, Cl. 224-42.03B.

Wegmann, Jacques; Becker, Carl; Zwahlen, Guenther; and Kuster, Werner, to Ciba-Geigy AG. Process for the dyeing of colored shaped articles of high polymer, synthetic resins and preparations for such process. 3,969,302, Cl. 260-30.40R.

Weigele, Manfred: *See—*
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 3,969,373.

Weiler, Ernest D., to Rohm and Haas Company. 3-Pyridylmethyl phenyl urea metal salt complexes. 3,969,357, Cl. 260-270.0PY.

Weinzinger, Hans; Hopf, Bruno; and Rigler, Gunter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method for checking the planarity of a cold-rolled ferromagnetic strip. 3,969,668, Cl. 324-34.00R.

Weiss, Hansjakob; Cremer, Dieter; and Kranz, Eginhard, to Interatom Internationale Atomreaktorbau GmbH. Device for taking samples of molten metals flowing in pipes. 3,968,695, Cl. 73-422.00R.

Werblin, David A., to Griffin Wellpoint Corporation. Wellpoint jetting head. 3,968,847, Cl. 175-402.000.

Wermuth, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Automatic dynamic compander system. 3,969,680, Cl. 330-29.000.

Werth, John; and Sklarchuk, Jack C., to ESB Incorporated. Sodium-aluminum halide, sulfur battery. 3,969,138, Cl. 136-6.0FS.

Wertz, Thomas D.: *See—*
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Westermann, Peter Henry, to BP Chemicals International Limited. Carboxyl terminated polychloroprenes and compositions containing them. 3,969,326, Cl. 526-11.100.

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Wetzel, Nelson. Brakeable hand truck. 3,968,974, Cl. 280-47.270.

Wheeler, Robert Charles: *See—*
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Whipple, William G.: *See—*
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White, Charles Arthur John, to Chloride Alcad Limited. Electric cells. 3,969,140, Cl. 136-14.000.

White, Deloy J. System for producing a colored motion picture film from black-and-white medium. 3,969,022, Cl. 352-38.000.

White, Edward Louis; Robertson, William Ernest; and Yu, William Heng-Sen, to NL Industries, Inc. Basic zinc phosphites. 3,969,293, Cl. 260-22.0CB.

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Wilfert, Karl, to Daimler-Benz Aktiengesellschaft. Tiltable indicia constructed as radiator emblem. 3,968,977, Cl. 280-727.000.

Wilke, William G. Voltage condition monitor. 3,969,635, Cl. 307-235.00R.

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Williams, John C.; and Kelly, George B., Jr., to United States of America, Congress. Method of deacidifying paper. 3,969,549, Cl. 427-248.000.

Williamson, Harold E.: *See—*
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Wilson, Glenn R.; Salyer, Ival O.; and Ball, George L., III, to United States of America, Energy Research and Development Administration. Epoxy resin. 3,969,286, Cl. 260-2.5EP.

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Wilson, William Donald, to Huestic Machine Corporation. Pattern cutting apparatus. 3,968,711, Cl. 83-171.000.

Windley, William Thomas: *See—*
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Windt, Robert James. Automatic lift system for air cushion vehicles. 3,968,851, Cl. 180-117.000.

Winkler, Alfred; Eggering, Albert; Stenzenberger, Volkmar; and Wilsch, Herbert, to AGFA-Gevaert, A.G. Circular magazine for photographic transparencies. 3,968,878, Cl. 206-455.000.

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Witte, Michael; and Mehta, Manankumar S., to U.S. Filter Corporation. Recovery of elemental sulfur from sulfur dioxide bearing waste gases. 3,969,492, Cl. 423-574.00L.

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Wolf-Gerate GmbH: *See—*
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Wolf, Johann, to Johann Wolf Gesellschaft m.b.H. KG, Firma. Top unloader for silos. 3,968,998, Cl. 302-56.000.

Wolf, Martin, to Boehringer Ingelheim GmbH. Method for reducing the heart beat frequency. 3,969,525, Cl. 424-273.000.

Wolfe, Denis G.; Mitts, Richard K.; Jackson, Wilbur F., deceased; and by Benton, Linda A., trust administrator. Refractory resistor with supporting terminal. 3,969,696, Cl. 338-315.000.

Wolff, Siegfried: *See—*
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Wolicki, Richard J., to Buffalo Brake Beam Company. Rod splice. 3,969,032, Cl. 403-310.000.

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Worlton, Dan L., deceased (by Worlton, June S., administratrix); and Robinson, Dan L., to Exxon Nuclear Company, Inc. Detection of fuel rod leakage. 3,969,187, Cl. 176-79.000.

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Woyton, Joseph T., to Reliance Electric Company. Frequency responsive polarity discriminator. 3,969,677, Cl. 328-140.000.

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Wright, John H., to General Electric Company. Silicone channel sealant. 3,969,309, Cl. 260-37.0SB.

Wrobel, Gunter; and Papst, Georg, to Papst-Motoren KG. Magnetic tape recording and/or reproducing apparatus. 3,968,942, Cl. 242-204.000.

Wu, Leon Li-Heng, to International Business Machines Corporation. Electron beam testing of integrated circuits. 3,969,670, Cl. 324-73.0PC.

Wu, Mu-Sheng, to General Electric Company. Process for recovering synthetic diamonds from pressed runs. 3,969,489, Cl. 423-446.000.

Wyant, John R.: *See—*
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Xenophou, Theodore. System of using vacuum for controlling heat transfer in building structures, motor vehicles and the like. 3,968,831, Cl. 165-1.000.

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Yamada, Shinji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Attachment assembly for preventing improper positional mounting. 3,969,011, Cl. 339-125.00R.

Yamada, Shintaro, to Chugairo Kogyo Kaisha Ltd. Method for incineration of a sludge containing chromium substance and apparatus therefor. 3,968,756, Cl. 110-12.000.

Yamaguchi, Yoshinobu: *See—*
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Yankee, Ernest W., to Upjohn Company, The. 8β, 11β, 12α-PGE_2 compounds. 3,969,396, Cl. 260-468.00D.

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Yoshino, Masahito, to Kabushiki Kaisha Suwa Seikosha. Step motor for electronic timepiece. 3,969,642, Cl. 310-49.00R.

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Zeblisky, Rudolph J., to Photocircuits Division of Kollmorgan Corporation. Precious metal sensitizing solutions. 3,969,554, Cl. 427-305.000.

Zeigler, Theodore R. Collapsible self-supporting structure. 3,968,808, Cl. 135-4.00R.

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Zeman, Jack R. Method and apparatus for molding an elastomeric fishing lure body. 3,968,951, Cl. 249-55.000.

Zenith Radio Corporation: *See—*
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Zentman, Leo, Bathtub safety gripping rail. 3,968,524, Cl. 4–185H.

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Zievers, James F., to Industrial Filter & Pump Mfg. Co. Process and apparatus for removing metallic ions from an electrolytic solution. 3,969,215, Cl. 204-276.000.

Zilver, Edwin, to Silverflex International N.W. Mounting bracket for a blind. 3,968,826, Cl. 160-323.00R.

Zimmer, Friedhelm; and Zimmer Herbert, to Dornier GmbH. Aircraft with shrouded propeller drive. 3,968,944, Cl. 244-1.00N.

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Zosel, Kurt, to Studiengesellschaft Kohle m.b.H. Process for the simultaneous hydrogenation and deodorisation of fats and/or oils. 3,969,382, Cl. 260-409.000.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JULY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aneja, Rajindra; and Chadha, Jaswinder Singh, to Lever Brothers Company. Phosphatide separation. Re. 28,903, Cl. 260-403.000.

B. F. Goodrich Company, The: *See*—
Kim, Heung T., Re. 28,901.

Bell Telephone Laboratories, Incorporated: *See*—
Hodges, David Albert, Re. 28,905.

Byers, John E.; and Claussen, Wells H. Drill bit device. Re. 28,900, Cl. 408-201.000.

Chadha, Jaswinder Singh: *See*—
Aneja, Rajindra; and Chadha, Jaswinder Singh, Re. 28,903.

Claussen, Wells H.: *See*—
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Concrete Pipe Machinery Company: *See*—
Trautner, Ferdinand A.; and Kent, LeRoy E., Re. 28,902.

Gleason, Patrick J., to Lumco Manufacturing Company. Cutting tool assembly. Re. 28,896, Cl. 29-97.000.

Gower, Roger L. Self-aligning traction assembly for vehicles. Re. 28,898, Cl. 152-239.000.

Himmelstein, Sydney; and Tveter, Richard S., to S. Himmelstein and Company. Torque control apparatus. Re. 28,899, Cl. 173-12.000.

Hodges, David Albert, to Bell Telephone Laboratories, Incorporated. Field effect transistor memory cell. Re. 28,905, Cl. 340-173.00R.

Kabushiki Kaisha Suwa Seikosha: *See*—
Natori, Machito, Re. 28,897.

Kent, LeRoy E.: *See*—
Trautner, Ferdinand A.; and Kent, LeRoy E., Re. 28,902.

Kim, Heung T., to B. F. Goodrich Company, The. Apparatus for refining polymeric material. Re. 28,901, Cl. 425-208.000.

Lever Brothers Company: *See*—
Aneja, Rajindra; and Chadha, Jaswinder Singh, Re. 28,903.

Lumco Manufacturing Company: *See*—
Gleason, Patrick J., Re. 28,896.

Maisonville, Richard C., to Scans Associates, Inc. Method and apparatus for testing internal combustion engines. Re. 28,904, Cl. 324-16.00R.

Natori, Machito, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Motion transforming mechanism. Re. 28,897, Cl. 74-112.000.

Noiles, Douglas G., to United States Surgical Corporation. Artificial hip joint. Re. 28,895, Cl. 3-1.912.

S. Himmelstein and Company: *See*—
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Scans Associates, Inc.: *See*—
Maisonville, Richard C., Re. 28,904.

Shinshu Seiki Kabushiki Kaisha: *See*—
Natori, Machito, Re. 28,897.

Trautner, Ferdinand A.; and Kent, LeRoy E., to Concrete Pipe Machinery Company. Vibratory core for concrete pipe making machine. Re. 28,902, Cl. 425-262.000.

Tveter, Richard S.: *See*—
Himmelstein, Sydney; and Tveter, Richard S., Re. 28,899.

United States Surgical Corporation: *See*—
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Ammons, Robert G., Sr. Purse guard. 240,568, 7–13–76, Cl. D87—2.

Aurora S.p.A.: *See*—
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Ball, Geo. J., Inc.: *See*—
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Bay-King Motors (1968) Ltd.: *See*—
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Bio-Research Glass, Inc.: *See*—
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Blair, Ralph A. Rack for skis and ski poles or the like. 240,487, 7–13–76, Cl. D6—125.

Bluestein, Bernard B.: *See*—
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Box, Theodor. Menu cover. 240,523, 7–13–76, Cl. D19—26.

Braun, Ralph V.: *See*—
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Brien, Marie I. Garment designing device. 240,510, 7–13–76, Cl. D10—64.

Brindley, Robert E., to Union Carbide Corp. Flashlight. 240,550, 7–13–76, Cl. D48—24.

Brindley, Robert E., to Union Carbide Corp. Flashlight. 240,551, 7–13–76, Cl. D48—24.

Brudy, Peter E., to Dominion Auto Accessories Ltd. Foldable emergency warning signal. 240,514, 7–13–76, Cl. D10—111.

Burin, Ralph R., to Intercraft Industries Corp. Photo frame. 240,492, 7–13–76, Cl. D6—236.

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Capitol Products Corp.: *See*—
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Carre, Alain, to Waterman, S.A. Ball-point pen. 240,524, 7–13–76, Cl. D19—45.

Carroll, Richard A., to The Lorac Co., Inc. Sign clip (A). 240,501, 7–13–76, Cl. D8—245.

Chicago Specialty Mfg. Co.: *See*—
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117R 3,968,778
140FG 3,968,779
141 3,968,780
3,968,781
191S 3,968,782

CLASS 124
25 3,968,783
27 3,968,784

CLASS 126
39J 3,968,785
270 3,968,786
390 3,968,787

CLASS 128
2.05C 3,968,788
49 3,968,789
82.1 3,968,790
90 3,968,791
132D 3,968,792
141R 3,968,793
142.3 3,968,794
3,968,795
173.1 3,968,796
232 3,968,797
284 3,968,798
287 3,968,799
343 3,968,800
352 3,968,801
419PG 3,968,802
482 3,968,803

CLASS 131
140C 3,968,804

CLASS 132
9 3,968,805
48R 3,968,806
53 3,968,807

CLASS 134
18 3,969,132
21 3,969,133
26 3,969,134
41 3,969,135
48 3,969,136
176 3,969,137

CLASS 135
4A 3,968,809
4R 3,968,808
45A 3,968,810

CLASS 136
6FS 3,969,138
6LN 3,969,139
14 3,969,140
26 3,969,141
83R 3,969,142
3,969,143
86A 3,969,144
86R 3,969,145
133 3,969,146
157 3,969,147
173 3,969,148
225 3,969,149

CLASS 137
114 3,968,811
188 3,968,812
493 3,968,813
505.18 3,968,814
602 3,968,815
606 3,968,816

CLASS 139
436 3,968,817

CLASS 141
78 3,968,818
155 3,968,819
330 3,968,820

CLASS 144
34R 3,968,821
312 3,968,822

CLASS 148
1.5 3,969,150
6.15Z 3,969,152
6.3 3,969,151
6.35 3,969,153
9R 3,969,154
11.5F 3,969,155
11.5R 3,969,156
14 3,969,157
16.5 3,969,158
26 3,969,159
32.5 3,969,160
38 3,969,161
111 3,969,162
174 3,969,163
175 3,969,164
187 3,969,165

CLASS 149
19.4 3,969,166
38 3,969,167

CLASS 150
.5 3,968,823
52R 3,968,824

CLASS 152
158 3,968,825
239 Re.28,898

CLASS 156
17 3,969,168
56 3,969,169
158 3,969,170
167 3,969,171
211 3,969,172
218 3,969,173
219 3,969,174

221 3,969,175
251 3,969,176
288 3,969,177
361 3,969,178
394 3,969,179
523 3,969,180
577 3,969,181
621 3,969,182

CLASS 159

49 3,969,183

CLASS 160

323R 3,968,826

CLASS 162

19 3,969,184

CLASS 164

23 3,968,827
41 3,968,828
160 3,968,829
196 3,968,830

CLASS 165

1 3,968,831
58 3,968,832
66 3,968,833
82 3,968,834
108 3,968,835
111 3,968,836
135 3,968,837

CLASS 166

.6 3,968,838
250 3,968,839
280 3,968,840

CLASS 169

48 3,968,841

CLASS 171

11 3,968,842

CLASS 173

12 Re.28,899
139 3,968,843

CLASS 174

35MS 3,969,572

CLASS 175

48 3,968,844
60 3,968,845
84 3,968,846
402 3,968,847

CLASS 176

68 3,969,185
3,969,186
79 3,969,187

CLASS 177

123 3,968,848
127 3,968,849
210 3,968,850

CLASS 178

5.6 3,969,581
6 3,969,571
6.6R 3,969,573
3,969,574
3,969,575
3,969,576
6.8 3,969,577
3,969,578
7.3R 3,969,579
46 3,969,580
66R 3,969,590
69.5R 3,969,582

CLASS 179

1G 3,969,583
3,969,588
2A 3,969,584
15AT 3,969,587
15FD 3,969,585
15A 3,969,586
27D 3,969,589
84R 3,969,591
90K 3,969,592
100.3B 3,969,593
175.3R 3,969,594

CLASS 180

117 3,968,851
118 3,968,852

CLASS 181

33C 3,968,853
40 3,968,854
118 3,968,855

CLASS 182

48 3,968,856
106 3,968,857
135 3,968,858

CLASS 187

9E 3,968,859
17 3,968,860
3,968,861

CLASS 188

1C 3,968,862
3,968,863
71.9 3,968,864
188 3,968,865

CLASS 192

58B 3,968,866

CLASS 195

28N 3,969,188
62 3,969,189
142 3,969,190

CLASS 197

1R 3,968,867
19 3,968,868

CLASS 198

3,968,869
240 3,968,870

CLASS 200

5A 3,969,595
43 3,969,596
44 3,969,597
144B 3,969,598
153T 3,969,599
159B 3,969,600
314 3,969,609

CLASS 202

141 3,969,191
230 3,969,192

CLASS 203

7 3,969,193
40 3,969,194
49 3,969,196

CLASS 204

14N 3,969,195
15 3,969,197
33 3,969,199
43T 3,969,198
50Y 3,969,219
79 3,969,200
83 3,969,201
105R 3,969,202
149 3,969,203
157.1R 3,969,204
158HA 3,969,205
159.15 3,969,206
180P 3,969,207
193 3,969,208
195R 3,969,209
195W 3,969,210
211 3,969,211
213 3,969,212
244 3,969,213
275 3,969,214
276 3,969,215
286 3,969,216
290F 3,969,217
299R 3,969,218

CLASS 206

1.5 3,968,871
222 3,968,872
223 3,968,873
248 3,968,874
315B 3,968,875
365 3,968,876
388 3,968,877
455 3,968,878
509 3,968,879
540 3,968,880

CLASS 208

11LE 3,969,220
139 3,969,221
210 3,969,222
310Z 3,969,223

CLASS 209

12 3,969,224
39 3,969,226
73 3,969,227
3,969,228
74R 3,969,229
127A 3,969,225

CLASS 210

22A 3,969,240
23H 3,969,241
25 3,969,242
3,969,243
38B 3,969,244
44 3,969,245
45 3,969,246
54 3,969,239
68 3,969,247
126 3,969,248
170 3,969,249
359 3,969,250

CLASS 211

128 3,968,881
189 3,968,882
201 3,968,883

CLASS 212

55 3,968,884

CLASS 214

1BC 3,968,885
6M 3,968,886
8.5D 3,968,887
16.4A 3,968,888
18R 3,968,889
75T 3,968,890
83.3 3,968,891
505 3,968,892
700 3,968,893

CLASS 215

220 3,968,894

CLASS 219

69C 3,969,602
69G 3,969,601
121LM 3,969,604
121P 3,969,603
208 3,969,605
237 3,969,606
272 3,969,607
300 3,969,608
441 3,969,610
502 3,969,611

CLASS 220

1.5 3,968,895
63R 3,968,896
204 3,968,897
260 3,968,898
266 3,968,899

CLASS 221

3 3,968,900
93 3,968,901
263 3,968,902

CLASS 222

1 3,968,903
25 3,968,904
70 3,968,905
243 3,968,906
416 3,968,907
563 3,968,908
600 3,968,909

CLASS 224

6 3,968,910
3,968,911
36 3,968,912
42.03B 3,968,913
45AA 3,968,914

CLASS 225

65 3,968,915
100 3,968,916

CLASS 226

2 3,968,917
188 3,968,920

CLASS 228

148 3,968,918
153 3,968,919

CLASS 229

2.5R 3,968,921
33 3,968,922
34HW 3,968,923
39B 3,968,924
62.5 3,968,925
66 3,968,926
70 3,968,927

CLASS 232

35 3,968,928

CLASS 233

21 3,968,929

CLASS 235

61.11E 3,969,612
61.11R 3,969,613
150.21 3,969,614
151.11 3,969,615
151.32 3,969,616
152 3,969,617
153AC 3,969,618
183 3,969,619

CLASS 239

107 3,968,930
125 3,968,931
142 3,968,932
171 3,968,933
230 3,968,934
289 3,968,935
550 3,968,936

CLASS 240

7.5 3,969,620
41.35C 3,969,621
140 3,969,622

CLASS 241

5 3,968,937
101.1 3,968,938

CLASS 242

43R 3,968,939
86.5R 3,968,940
193 3,968,941
204 3,968,942
212 3,968,943

CLASS 244

1N 3,968,944
3.28 3,968,945
42D 3,968,946
63 3,968,947
155R 3,968,948

CLASS 248

11 3,968,949
359 3,968,950

CLASS 249

55 3,968,951

CLASS 250

275 3,969,623
315R 3,969,624
322 3,969,625
344 3,969,626
358T 3,969,627
402 3,969,628
503 3,969,629
515 3,969,630
527 3,969,631

CLASS 252

8.1 3,969,230
8.8 3,969,231
12.6 3,969,232
22 3,969,233
33 3,969,234
42.7 3,969,235
49.5 3,969,236
49.9 3,969,237
62.1L 3,969,238
62.1P 3,969,251
63.2 3,969,252
77 3,969,253
78 3,969,254
87 3,969,255
92 3,969,256
102 3,969,257
106 3,969,258
107 3,969,259
147 3,969,260
179 3,969,261
182 3,969,262
186 3,969,263
299 3,969,264
309 3,969,265
313S 3,969,266
415 3,969,267
423 3,969,268
429B 3,969,269
430 3,969,270
3,969,271
431P 3,969,272
435 3,969,273
455R 3,969,275
455Z 3,969,276
3,969,277
456 3,969,274
457 3,969,542
513 3,969,278
521 3,969,279
522 3,969,280
542 3,969,281
559 3,969,282

CLASS 254

134.3R 3,968,952
150R 3,968,953
186R 3,968,954

CLASS 259

192 3,968,955

CLASS 260

2EN 3,969,283
2.1E 3,969,284
2.2R 3,969,285
2.5BF 3,969,288
2.5EP 3,969,286
2.5L 3,969,289
2.5N 3,969,290
8 3,969,287
17.3 3,969,291
18EP 3,969,292
22CB 3,969,293
26 3,969,294
29.4UA 3,969,300
29.6HN 3,969,298
3,969,299
29.6TA 3,969,296
29.6XA 3,969,297
29.6S 3,969,295
30.4N 3,969,301
30.4R 3,969,302
31.8C 3,969,303
32.6PQ 3,969,304
32.6N 3,969,305
33.6R 3,969,306
37SB 3,969,308
3,969,309
3,969,310
37R 3,969,307
40P 3,969,312
40R 3,969,311
3,969,313
42 3,969,314
45.75B 3,969,318
45.75N 3,969,317
45.75S 3,969,319
45.8NW 3,969,315
45.8N 3,969,316
47ET 3,969,320
59R 3,969,321
63N 3,969,322
73R 3,969,323
75T 3,969,324
78.41 3,969,325
79.3M 3,969,329
80.78 3,969,331
112R 3,969,336
3,969,337
123.5 3,969,338
159 3,969,339
233.3R 3,969,340
233.5 3,969,341
239.1 3,969,342
239.3A 3,969,344
239.3T 3,969,343
239.55R 3,969,345
240E 3,969,346
243R 3,969,347
3,969,348
247.1H 3,969,350
3,969,351
247.1M 3,969,349
248A 3,969,352
249.5 3,969,353
251R 3,969,354
256.4R 3,969,355
268R 3,969,356
270PY 3,969,357
287T 3,969,463
294.8C 3,969,358
294.9 3,969,359
295AM 3,969,361
295CA 3,969,362
295R 3,969,360
296AE 3,969,363
298 3,969,364
307G 3,969,365
308R 3,969,366
326.12R 3,969,367
340.5 3,969,368
343.2R 3,969,369
343.6 3,969,370
346.1R 3,969,371
346.2R 3,969,372
347.3 3,969,373
382 3,969,374
395 3,969,464
400 3,969,375
403 Re.28,903
408 3,969,376
3,969,377
3,969,378
3,969,379
3,969,380
3,969,381
409 3,969,382
410.5 3,969,383
410.9N 3,969,384
410.9R 3,969,385
429R 3,969,386
448R 3,969,387
453P 3,969,388
3,969,389
465.3 3,969,390
468D 3,969,396
468H 3,969,393
468K 3,969,391
471C 3,969,394
473F 3,969,392
484R 3,969,395
501.11 3,969,397
502.5 3,969,398
513R 3,969,399
3,969,400
518A 3,969,401
520R 3,969,402
521H 3,969,403
3,969,404
524M 3,969,405
527R 3,969,465
534M 3,969,406
554 3,969,466
561S 3,969,407
566A 3,969,408
570.5CA 3,969,409
570.6 3,969,410
570.9 3,969,467
574 3,969,468
577 3,969,411
586E 3,969,412
604HF 3,969,413
607B 3,969,414
613D 3,969,415
615A 3,969,416
615B 3,969,417
618D 3,969,419
618R 3,969,418
621A 3,969,420
621B 3,969,422
621C 3,969,421
633 3,969,423
662A 3,969,424
666R 3,969,425
668R 3,969,426
676R 3,969,427
680E 3,969,428
683.15D 3,969,429
823 3,969,430
876R 3,969,431
880R 3,969,432
885 3,969,433
891 3,969,469
897A 3,969,470
897B 3,969,434
900 3,969,435
901 3,969,436
937 3,969,437
940 3,969,438
942 3,969,439
944 3,969,440
948 3,969,441
951 3,969,442
955 3,969,443
956 3,969,444

CLASS 261

44R 3,969,445
87 3,969,446
111 3,969,447
112 3,969,448
153 3,969,449
3,969,450

CLASS 264

29 3,969,451
41 3,969,452
42 3,969,453
50 3,969,471
3,969,472
78 3,969,454
89 3,969,455
90 3,969,473
109 3,969,459
3,969,460
111 3,969,456
117 3,969,457
154 3,969,458
163 3,969,461
219 3,969,474
237 3,969,462
284 3,969,565
310 3,969,475

CLASS 266

226 3,968,956
257 3,968,957

CLASS 267

47 3,968,958

CLASS 271

137 3,968,959
187 3,968,960

CLASS 272

44 3,968,961
55 3,968,962
65 3,968,964
134 3,968,963

CLASS 273

73D 3,968,966
73J 3,968,965
95A 3,968,967
95H 3,968,968

CLASS 277

15 3,968,969
106 3,968,970
177 3,968,971

CLASS 279

2R 3,968,972

CLASS 280

11.2 3,968,973
47.27 3,968,974
95R 3,968,975
511 3,968,981
709 3,968,976
727 3,968,977
731 3,968,979
734 3,968,980
745 3,968,978

CLASS 285

287 3,968,982

CLASS 292

201 3,968,983
229 3,968,984
340 3,968,985

CLASS 294

65.5 3,968,986
78R 3,968,987
82R 3,968,988

CLASS 296

29 3,968,989

CLASS 297

45 3,968,991
162 3,968,992
355 3,968,993
390 3,968,994
452 3,968,990

CLASS 299

76 3,968,995

CLASS 301

37R 3,968,996

CLASS 302

37 3,968,997
56 3,968,998
66 3,968,999

CLASS 303
6C 3,969,000
21F 3,969,001
3,969,002
3,969,003

CLASS 307
205 3,969,632
3,969,633
221D 3,969,634
235H 3,969,636
235R 3,969,635
237 3,969,637
243 3,969,638
270 3,969,639

CLASS 308
9 3,969,004
209 3,969,005

CLASS 310
9.1 3,969,640
9.5 3,969,641
49R 3,969,642
53 3,969,643
152 3,969,644
172 3,969,645

CLASS 312
15 3,969,007
221 3,969,008
234.1 3,969,006
320 3,969,009

CLASS 313
359 3,969,646
477HC 3,969,647
482 3,969,648

CLASS 315
78 3,969,649
169TV 3,969,650
3,969,651
224 3,969,652
403 3,969,653

CLASS 317
5 3,969,654
12A 3,969,655
98 3,969,656
157.5PM 3,969,657

CLASS 318
202 3,969,658
237 3,969,659
338 3,969,660
375 3,969,661
561 3,969,663
565 3,969,664
645 3,969,662

CLASS 320
35 3,969,665

CLASS 323
74 3,969,666

CLASS 324
16R Re.28,904
29.5 3,969,667
34R 3,969,668
65R 3,969,669
73PC 3,969,670
119 3,969,671
133 3,969,672

CLASS 325
16 3,969,673
42 3,969,674
50 3,969,675

CLASS 328
121 3,969,676
140 3,969,677
167 3,969,678

CLASS 330
22 3,969,679
29 3,969,680
56 3,969,681
85 3,969,682
144 3,969,683

CLASS 331
94.5C 3,969,684
3,969,685
3,969,687
3,969,688
94.5H 3,969,686
107R 3,969,689

CLASS 333
7R 3,969,690
21R 3,969,691
73W 3,969,692
98S 3,969,693

CLASS 337
161 3,969,694
236 3,969,695

CLASS 338
315 3,969,696

CLASS 339
17C 3,969,010
125R 3,969,011
252P 3,969,012

CLASS 340
146.3WD 3,969,698
3,969,700
146.3F 3,969,699
172.5 3,969,701
3,969,702
3,969,703
3,969,704
3,969,722
3,969,723
3,969,724
173AM 3,969,707
173FF 3,969,708
173RC 3,969,705
173R Re.28,905
3,969,706
224 3,969,709
248B 3,969,697
253R 3,969,710
255 3,969,711
261 3,969,712
265 3,969,713
267C 3,969,714
324AD 3,969,716
324M 3,969,715
3,969,717
3,969,718
336 3,969,719
371 3,969,720
381 3,969,721

CLASS 343
6.5R 3,969,725
16M 3,969,726
105R 3,969,727
702 3,969,728
756 3,969,729
770 3,969,730
840 3,969,731
895 3,969,732

CLASS 346
1 3,969,733
33ME 3,969,734

CLASS 350
87 3,969,013
96WG 3,969,016
96C 3,969,014
3,969,015
162SF 3,969,017
187 3,969,018

CLASS 351
13 3,969,019
17 3,969,020

CLASS 352
27 3,969,021
38 3,969,022

CLASS 354
29 3,969,735
127 3,969,736
141 3,969,737
230 3,969,738
3,969,739
275 3,969,740
299 3,969,741
318 3,969,742

CLASS 356
33 3,969,023
39 3,969,024

CLASS 357
4 3,969,743
14 3,969,750
22 3,969,744
3,969,745
30 3,969,746
3,969,751
3,969,747
46 3,969,748
49 3,969,749
51 3,969,752
60 3,969,753
65 3,969,754

CLASS 358
4 3,969,755
3,969,756
3,969,757
8 3,969,758
3,969,759
3,969,760
14 3,969,761
38 3,969,762
42 3,969,763
47 3,969,764

CLASS 360
59 3,969,765
85 3,969,766
99 3,969,767
107 3,969,768
113 3,969,769
121 3,969,770
3,969,771

CLASS 401
2 3,969,025
37 3,969,026
199 3,969,027
279 3,969,028

CLASS 403
26 3,969,029
132 3,969,030
239 3,969,031
310 3,969,032
322 3,969,033
357 3,969,034

CLASS 404
98 3,969,035

CLASS 408
76 3,969,036
201 Re.28,900

CLASS 416
176 3,969,037

CLASS 417
218 3,969,038
244 3,969,039
292 3,969,040
295 3,969,041
354 3,969,042
366 3,969,043
410 3,969,044
471 3,969,045
517 3,969,046

CLASS 418
18 3,969,047
83 3,969,048
91 3,969,049

CLASS 423
1 3,969,476
19 3,969,477
54 3,969,478
58 3,969,484
210 3,969,479
213.8 3,969,480
219 3,969,481
235 3,969,482
305 3,969,483
337 3,969,485
351 3,969,486
3,969,487
421 3,969,488
446 3,969,489
481 3,969,490
499 3,969,491
574L 3,969,492
579 3,969,493
633 3,969,494
648 3,969,495

CLASS 424
1 3,969,496
10 3,969,500
12 3,969,497
28 3,969,498
52 3,969,499
118 3,969,501
3,969,515
181 3,969,516
200 3,969,517
239 3,969,502
240 3,969,503
244 3,969,504
246 3,969,518
250 3,969,505
251 3,969,506
3,969,519
3,969,520
258 3,969,507
262 3,969,521
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Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*